DRAFT Supplemental Environmental Impact Statement, Greater Sage-Grouse 2020

2 Hard Looks, 2011-15 and 2017-19

143 alternatives considered in **18 EISs**

48,023 total pages of NEPA analysis

$16.9 million total cost

2,313 people attended

54 public meetings

326 partners and cooperators

Public Comments

8,512 unique scoping comments

15,885 substantive comments on draft EISs

Habitat Investments

Treatment and Restoration, ***2013–19***

$294 million **2.7 million acres**

2020, planned

$37 million **316,000 acres**

Another Hard Look, 2020

Nevada/California

United States Department of the Interior
BUREAU OF LAND MANAGEMENT

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February 10, 2020

In Reply To:
1610 (930)

Dear Reader:

The Nevada and Northeastern California Greater Sage-Grouse Draft Supplemental Environmental Impact Statement (DSEIS) is available for your review and comment. The Bureau of Land Management (BLM) prepared this document in accordance with the National Environmental Policy Act of 1969, as amended, the Federal Land Policy and Management Act of 1976, as amended, implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and other applicable law and policy. Please note when reading this document that we refer to the entire planning process that culminated in a Record of Decision in March 2019 as the 2019 Planning Process or Effort. The NEPA analysis, including the DEIS and the FEIS were completed in 2018 so we refer those documents as the 2018 DEIS and the 2018 FEIS.

The affected area includes the following BLM Nevada District Offices: Battle Mountain, Carson City, Elko, Ely, and Winnemucca and the BLM California Field Offices of Applegate (Alturas and Surprise) and Eagle Lake. The planning area encompasses approximately 45 million surface acres administered by the BLM.

The Management Alignment Alternative has been identified in the DSEIS as the preferred alternative. Identification of the preferred alternative does not indicate any commitments on the part of the BLM with regard to a final decision. In developing the Final SEIS, which is the next phase of the planning process, the decision maker may select various management actions from each of the alternatives analyzed in the DSEIS for the purpose of creating a management strategy that best meets the needs of the resources and values in this area under the BLM multiple use and sustained yield mandate.

The BLM encourages the public to review and provide comments on the DSEIS. The DSEIS is available on the project website at: https://goo.gl/uz89cT. Hard copies are also available for public review at BLM offices within the planning area. Public comments will be accepted for forty-five (45) calendar days following the Environmental Protection Agency's publication of its Notice of Availability in the *Federal Register.* The BLM can best utilize your comments and resource information submissions if received within the review period.

Written comments may be submitted as follows (submittal of electronic comments is encouraged):

1. Written comments may be submitted electronically at:
   https://goo.gl/uz89cT.

2. Written comments may also be mailed directly, or delivered to, the BLM at:

Carolyn Sherve-Acting NV Sage-Grouse Lead
Bureau of Land Management
Nevada State Office
1340 Financial Blvd, Reno, NV 89502

or

Arlene Kosic-CA Sage-Grouse Lead
Bureau of Land Management
Surprise Station
602 Cressler Street
Cedarville, CA 96104

To facilitate analysis of comments and information submitted, we encourage you to submit comments in an electronic format. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Thank you for your continued interest in the Greater Sage-Grouse DSEIS. We appreciate the information and suggestions you contribute to the process.

Sincerely,

Karen E. Mouritsen
California State Director
Bureau of Land Management

Jon Raby
Nevada State Director
Bureau of Land Management

Nevada and Northeastern California Greater Sage-Grouse
Draft Supplemental Environmental Impact Statement

Responsible Agency: United States Department of the Interior
Bureau of Land Management

Abstract: This draft supplemental environmental impact statement (DSEIS) has been prepared by the United States Department of the Interior (DOI), Bureau of Land Management (BLM). The DSEIS describes and analyzes the eight alternatives considered during the 2015 and 2019 Greater Sage-Grouse planning processes, BLM's consultation and coordination process with federal and state stakeholders, and the rigorous analysis completed to align BLM Greater Sage-Grouse management with the State of Nevada's Sage-Grouse Conservation Plan and the State of California's management direction.

On October 16, 2019, the US District Court for the District of Idaho issued an order granting a motion for a preliminary injunction filed by Plaintiffs Western Watersheds Project, WildEarth Guardians, Center for Biological Diversity, and Prairie Hills Audubon Society. The court found that the Plaintiffs were likely to succeed on the merits of their claims that the BLM violated the National Environmental Policy Act (NEPA) when adopting the 2019 Greater Sage-Grouse plan amendments. The BLM has prepared this DSEIS to review its previous NEPA analysis, clarify and augment it where necessary, and provide the public with additional opportunities to review and comment. The DSEIS, including any comments that the agency receives, will help the BLM determine whether its 2015 and 2019 land use planning and NEPA processes have sufficiently addressed Greater Sage-Grouse habitat conservation or whether the BLM should initiate a new land use planning process to consider additional alternatives or new information. To inform this decision that the BLM will make, it has prepared this DSEIS to address four specific issues: the range of alternatives, need to take a "hard look" at environmental impacts, cumulative effects analysis, and the BLM's approach to compensatory mitigation.

Review Period: Comments on the Nevada and Northeastern California Greater Sage-Grouse Draft Supplemental Environmental Impact Statement will be accepted for forty-five (45) calendar days following publication of the United States Environmental Protection Agency's Notice of Availability in the Federal Register

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ADH	all designated habitat
ARMPA	approved resource management plan amendment
BLM	Bureau of Land Management
BMP	best management practice
BSU	biologically significant unit
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulation
COT	Conservation Objectives Team
CSU	controlled surface use
DOI	US Department of the Interior
EIS	environmental impact statement
FIAT	Fire and Invasives Assessment Tool
FLMPA	Federal Land Management and Policy Act
Forest Service	US Department of Agriculture, Forest Service
GHMA	General Habitat Management Area
HMA	habitat management area
HQT	Habitat Quantification Tool
IM	Instruction Memorandum
IMT	incident management team
LUPA	Land Use Plan Amendment
MZ	management zone
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NSO	no surface occupancy
NTT	National Technical Team
OHMA	Other Habitat Management Area
PAC	Priority Area for Conservation
PHMA	Priority Habitat Management Area
RDF	required design feature
RMP	resource management plan
RMPA	resource management plan amendment
ROD	record of decision
ROW	right-of-way

SETT	Sagebrush Ecosystem Technical Team
SFA	sagebrush focal area
SGMA	Sage-Grouse Management Area
SO	Secretarial Order
SRP	special recreation permit
TL	timing limitation
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WO	Washington Office

Executive Summary

ES.1 Introduction

Greater Sage-Grouse is a state-managed species that depends on sagebrush steppe ecosystems. These ecosystems are managed in partnership across its range by federal, state, and local authorities. State agencies responsible for fish and wildlife management possess broad responsibility for protecting and managing fish, wildlife, and plants within their borders, except where preempted by federal law. Similarly, the BLM has broad responsibilities to manage public lands and resources for the public's benefit. Approximately half of Greater Sage-Grouse habitat is managed by the BLM and Forest Service. State agencies are at the forefront of efforts to maintain healthy fish and wildlife populations and to conserve at-risk species. State-led efforts to conserve the species and its habitat date back to the 1950s. For the past two decades, state wildlife agencies, federal agencies, and many others in the range of the species have been collaborating to conserve Greater Sage-Grouse and its habitats. The BLM prepared this Draft Supplemental Environmental Impact Statement (DSEIS) to clarify analysis from the 2018 Final Environmental Impact Statement (2018 Final EIS) published as part of the 2019 Plan Amendment Process and subsequent Record of Decision. This DSEIS clarifies the range of alternatives analyzed, the range-wide nature of the analysis, and other aspects of the 2018 Final EIS where information was incorporated by reference from the 2015 Greater Sage-Grouse Land Use Plan Amendments.

In 2010, USFWS determined that listing the Greater Sage-Grouse under the Endangered Species Act of 1973 (ESA) was "warranted, but precluded" by other priorities. In its determination, the USFWS found there to be inadequate regulatory mechanisms to protect Greater Sage-Grouse and conserve its habitat. In response, the BLM, in coordination with the Forest Service, USFWS, and state agencies, developed a management strategy that included targeted Greater Sage-Grouse management actions. In 2015, the BLM and Forest Service adopted land use plan amendments and revisions to 98 BLM and Forest Service land use plans across ten western states. These planning decisions addressed, in part, threats to the Greater Sage-Grouse and its habitat. The amended land use plans govern the management of 67 million acres of Greater Sage-Grouse habitat on federal lands.

In September 2015, the USFWS determined that the Greater Sage-Grouse did not warrant listing under the ESA. The USFWS based its 2015 determination, in part, on the regulatory certainty provided by the conservation commitments and management actions in the federal planning decisions, as well as on other private, state, and federal conservation efforts.

The 2015 plans recommended that sagebrush focal areas (SFAs) be proposed for withdrawal from location and entry under the Mining Law of 1872. While the BLM later proposed to withdraw these areas, it canceled that proposed withdrawal on October 11, 2017. The BLM determined that the proposal to withdraw these areas was unreasonable in light of the data that showed that mining affected less than 0.1 percent of Greater Sage-Grouse across its occupied range.

On March 29, 2017, the Secretary of the Interior issued Secretary's Order 3349, *American Energy Independence*. It ordered DOI agencies to reexamine practices "to better balance conservation strategies and policies with the equally legitimate need of creating jobs for hard-working American families."

On June 7, 2017, the Secretary issued Secretary's Order 3353 with a purpose of enhancing cooperation among eleven western states and the BLM in managing and conserving Greater Sage-Grouse. Secretary's Order 3353 directed an Interior Review Team, consisting of the BLM, the US Fish and Wildlife Service (USFWS), and US Geological Survey (USGS), to coordinate with the Greater Sage-Grouse Task Force. They also were directed to review the 2015 Greater Sage-Grouse plans and associated policies to identify provisions that may require modification, including opportunities to enhance consistency with individual state plans and better balance the BLM's multiple-use mission, as directed by Secretary's Order 3349.

On August 4, 2017, the Interior Review Team submitted its Report in Response to Secretary's Order 3353. The report the team recommended modifying the Greater Sage-Grouse plans and associated policies to better align with the individual state plans. On August 4, 2017, the Secretary issued a memo to the Deputy Secretary directing the BLM to implement the recommendations found in the report.

In the *Federal Register* of October 11, 2017, the BLM published the Notice of Intent to Amend Land Use Plans Regarding Greater Sage-Grouse Conservation and Prepare Associated Environment Impact Statements or Environmental Assessments.

The BLM continues to prioritize efforts to conserve Greater Sage-Grouse and restore sagebrush habitat and increase the amount of acres treated in every Fiscal Year. In Fiscal Year 2018 approximately 530,000 acres were treated and BLM is currently working on more detailed metrics and data for these acres treated. Also, in Fiscal Year 2017 the BLM treated approximately 480,000 acres, for an increase of almost 100,000 acres over 2016 accomplishments. The Fiscal Year 2017 treatments included 185,000 acres of conifer removal; 65,000 acres of fuel breaks; 125,000 acres with invasive species treatments; 10,000 acres of habitat protection; and restored habitat on 94,000 acres of uplands and another 600 acres of riparian habitat. In 2019 California conducted habitat treatments on 5,000 acres and Nevada conducted treatments on 126,700 acres.

The BLM is committed to working directly with local communities on sagebrush conservation efforts and to emulate the successes demonstrated by the Natural Resources Conservation Service (NRCS) through the Greater Sage-Grouse Initiative on private lands. These efforts include:

- an agreement with the Intermountain West Joint Venture to work with local cattlemen associations to improve sagebrush rangeland conditions through actions such as controlling invasive species, improving mesic areas, and removing invasive conifers;
- a Memorandum of Understanding between the BLM, NRCS, and the Forest Service resulting in development of a map that identifies areas where the agencies have ongoing restoration projects and opportunities for additional collaboration across land ownerships and associated landscapes;
- promoting a locally led collaborative conservation, the BLM, the USFWS, and the Geological Survey are collaborating with the Western Association of Fish and Wildlife Agencies as they lead the development and implementation of the Sagebrush Conservation Strategy;
- working with livestock permittees and stakeholders on "targeted grazing" to utilize grazing as a tool to create and maintain fuel breaks to manage the threats of wildfire and invasive species in or next to Greater Sage-Grouse habitats; and,
- working to develop "outcome-based grazing" to provide greater flexibility for livestock permittees and land managers to meet habitat objectives as conditions on-the-ground change.

During the 2019 planning process's public scoping period, the BLM sought public comments on whether all, some, or none of the 2015 Greater Sage-Grouse plans should be amended, what issues should be considered, and if plans should be completed at the state level rather than at the national level. In addition, the BLM recognizes that the Greater Sage-Grouse is a state-managed species that depends on sagebrush steppe habitats managed in partnership by federal, state, and local authorities. Input from governors would weigh heavily when the BLM considers what management changes should be made and when ensuring consistency with the BLM's multiple-use mission.

Further, in the 2018 Draft EIS the BLM requested public comments on the BLM's approach to compensatory mitigation. In response to these comments and information supplied by the states about how to align with their compensatory mitigation laws and policies, the 2018 Final EIS clarified the BLM's approach to compensatory mitigation in its Management Alignment Alternative. Through this Draft Supplemental EIS (DSEIS), the BLM now seeks additional comment from the public on compensatory mitigation.

This DSEIS also addresses and clarifies the BLM's reliance on scientific information, including how the BLM addresses the recommendation and objectives in the NTT and COT reports. The BLM, the USFWS, states and other federal agency partners prepared the NTT (2011) and the COT (2013) reports to identify rangewide sage-grouse conservation objectives and conservation measures that would: inform the USFWS 2015 decision under the Endangered Species Act and for partners; and provide guidance for the BLM to consider through land use planning, which the BLM did in 2015 and 2019, and again in this DSEIS.

Further, at the time that the NTT and COT reports were being developed, the BLM, USFWS, and state agencies had not completely developed or established the robust regulatory programs to conserve Greater Sage-Grouse that exist today.

In 2015, the BLM developed an action alternative around the NTT report. In the 2018 Final EIS, the BLM incorporated this analysis by reference. The BLM also coordinated with the USFWS during the process culminating in the 2019 RODs to make sure that the conservation measures from the NTT and COT informed the management alignment alternative (**Appendix H).** Including the USFWS as a cooperating agency during the 2019 planning process ensured that BLM used the same materials and newest science that the USFWS uses and recommends for Greater Sage-Grouse management.

This DSEIS also clarifies how the BLM considered comments, including those of other federal agencies (including EPA) and experts, when developing its 2019 planning decisions.

In 2018, the Environmental Protection Agency (EPA) provided comments on the Draft RMPAs/EISs. Specifically, they provided six comments on the Idaho Draft RMPA/EIS, seven comments on the Nevada/Northeast California Draft RMPA/EIS, six on the Utah Draft RMPA/EIS, three on the Wyoming Draft RMPA/EIS, six on the Oregon Draft RMPA/EIS, and five on the Colorado Draft RMPA/EIS. EPAs comments include suggestions and questions regarding lek buffers, recent science, mitigation, adaptive management, and fluid minerals. BLM responded to each of EPAs comments and made corrections and/or changes in the 2018 Final EISs. The complete EPA comment analysis can be found in the administrative record.

ES.2 PURPOSE OF AND NEED FOR ACTION

In the Federal Land Policy and Management Act (FLPMA), Congress provided the BLM with discretion and authority to manage public lands for multiple use and sustained yield and declared it the policy of the United States to, consistent with the laws governing the administration of the public lands, coordinate planning activities with the land use planning and management programs of other federal, state, and local governments. Further, FLPMA specifically provides that it neither enlarges nor diminishes the authority of the states in managing fish and wildlife. As the sovereign entities with the lead role in managing game species, including Greater Sage-Grouse, states play a critical role in conserving the Greater Sage-Grouse and its habitat.

In the 2019 Planning effort the BLM modified its approach to managing Greater Sage-Grouse habitat in land use plans by (1) enhancing cooperation and coordination with the States of Nevada and California, (2) aligning with DOI and BLM policies issued since 2015, and (3) incorporating appropriate management flexibility and adaptation to better align with Nevada's and California's conservation plans. The BLM achieved these goals while maintaining the vast majority of sage-grouse protections it incorporated into its land use plans in 2015. By implementing these land use plan conservation measures and continuing to exercise its discretion to approve future project proposals under appropriate terms and conditions or deny them where appropriate, the BLM can adequately protect sage-grouse and its habitat while meeting its general obligation under FLPMA to manage public lands under principles of multiple use and sustained yield.

On October 16, 2019, the US District Court for the District of Idaho issued an order granting a motion for a preliminary injunction filed by Plaintiffs Western Watersheds Project, WildEarth Guardians, Center for Biological Diversity, and Prairie Hills Audubon Society. The court found that the Plaintiffs were likely to succeed on the merits of their claims that the BLM violated the National Environmental Policy Act (NEPA) when adopting the 2019 sage-grouse plans.

The BLM has prepared this DSEIS to review its previous NEPA analysis, clarify and augment it where necessary, and provide the public with additional opportunities to review and comment. The BLM's DSEIS, including any comments that the agency receives, will help the BLM determine whether its 2015 and 2019 land use planning and NEPA processes have sufficiently addressed sage-grouse habitat conservation or whether the BLM should initiate a new land use planning process to consider additional alternatives or new information. To inform this decision that the BLM will make, it has prepared this DSEIS to address four specific issues: the range of alternatives, need to take a "hard look" at environmental impacts, cumulative effects analysis, and the BLM's approach to compensatory mitigation.

ES.3 ITEMS TO BE CLARIFIED IN THIS DSEIS

The items considered in this DSEIS are related to the analysis in the 2018 Final EIS. These items are:

- clarifying the range of alternatives (including how the BLM considered the full range of the 2015 alternatives in the 2019 planning process),
- taking a hard look and using the best available science (including clarified effects analysis, how the 2015 and 2019 Final EISs addressed the NTT and COT recommendations and conservation measures) (**Appendix H**),

- clarifying that the cumulative effects analysis was done at the range wide level and organized by WAFWA Management Zone (MZs) Updated language also highlights why WAFWA MZs were used,
- an updated Reasonably Foreseeable Future Actions.

ES.4 ANALYSIS CONCLUSIONS

The additional information provided in this SEIS do not change analytical conclusions from either the 2018 Proposed RMPA/Final EIS or the 2015 Proposed LUPA/Final EIS. See summary of environmental consequences from 2018 in Section ES.6of the Proposed RMPA/Final EIS and from 2015 in Section 2.12 of the Proposed LUPA/Final EIS.

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Chapter 1. Purpose and Need for Action

1.1 INTRODUCTION

Greater Sage-Grouse (*Centrocercus urophasianus*) is a state-managed species dependent on sagebrush steppe ecosystems that are managed in partnership across its range by federal, state, local, and private authorities. State agencies responsible for fish and wildlife management possess broad powers for the protection and management of fish, wildlife, and plants within their borders, except where preempted by federal law. Similarly, the Department of the Interior (DOI) has broad responsibilities to manage federal lands and resources for the public's benefit. The BLM and US Forest Service (Forest Service) manage approximately half of the Greater Sage-Grouse habitat range-wide across 11 states; approximately 20.5 million acres of this is within the Nevada and Northeastern California Sub-regional planning area.

State and local agencies are at the forefront of efforts to maintain healthy fish and wildlife populations and to conserve at-risk species. State-led efforts to conserve Greater Sage-Grouse and its habitat date back to the 1950s. For the past two decades, state wildlife agencies, local agencies, federal agencies, and many others in the range of the species have been collaborating to conserve Greater Sage-Grouse and its habitats.

In response to a 2010 determination by the US Fish and Wildlife Service (USFWS) that the listing of the Greater Sage-Grouse under the Endangered Species Act was "warranted, but precluded by higher priority listing actions," the BLM in coordination with the DOI and the US Department of Agriculture developed a management strategy that included targeted Greater Sage-Grouse management actions. In 2015, the agencies adopted amendments and revisions to 98 BLM and Forest Service land use plans (LUPs) across 10 western states. The 2015 LUPs addressed, in part, threats to the Greater Sage-Grouse and its habitat. The amended LUPs govern the management of 67 million acres of Greater Sage-Grouse habitat on federal lands.

In September 2015, the USFWS determined that the Greater Sage-Grouse did not warrant listing under the Endangered Species Act of 1973. The USFWS attributed its 2010 "warranted, but precluded" determination primarily to "inadequate regulatory mechanisms." In concluding "not warranted" in 2015, the USFWS based its decision in part on regulatory certainty from the conservation commitments and management actions in the federal land use plan amendments (LUPAs) and revisions, as well as on other private, state, and federal conservation efforts.

The BLM continues to prioritize efforts to conserve Greater Sage-Grouse and restore sagebrush habitat and increase the number of acres treated in every Fiscal Year. In Fiscal Year 2017 the BLM treated approximately 480,000 acres, for an increase of almost 100,000 acres over 2016 accomplishments. The Fiscal Year 2017 treatments included 185,000 acres of conifer removal; 65,000 acres of fuel breaks; 125,000 acres with invasive species treatments; 10,000 acres of habitat protection; and restored habitat on 94,000 acres of uplands and another 600 acres of riparian habitat. Also, in Fiscal Year 2018 the BLM treated approximately 530,000 acres and the BLM is currently working on more detailed metrics and data for these acres treated. In 2019 California conducted habitat treatments on 5,000 acres and Nevada conducted treatments on 126,700 acres.

The BLM is committed to working directly with local communities on sagebrush conservation efforts and to emulate the successes demonstrated by the Natural Resources Conservation Service (NRCS) through the Sage-Grouse Initiative on private lands. These efforts include:

- an agreement with the Intermountain West Joint Venture to work with local cattlemen associations to improve sagebrush rangeland conditions through actions such as controlling invasive species, improving mesic areas, and removing invasive conifers;
- a Memorandum of Understanding between the BLM, NRCS, and the Forest Service resulting in development of a map that identifies areas where the agencies have ongoing restoration projects and opportunities for additional collaboration across land ownerships and associated landscapes;
- promoting locally led collaborative conservation, the BLM, the USFWS, and the Geological Survey are collaborating with the Western Association of Fish and Wildlife Agencies as they lead the development and implementation of the Sagebrush Conservation Strategy;
- working with livestock permittees and stakeholders on "targeted grazing" to utilize grazing as a tool to create and maintain fuel breaks to manage the threats of wildfire and invasive species in or next to Greater Sage-Grouse habitats; and,
- working to develop "outcome-based grazing" to provide greater flexibility for livestock permittees and land managers to meet Habitat Objectives for Greater Sage-Grouse (Table 2-2 of the 2015 Final EIS) as conditions on-the-ground change.

The 2015 LUPAs recommended that approximately 10 million acres of SFAs be proposed for withdrawal, 2.8 million acres of which fall within Nevada; however, a proposed withdrawal of Sagebrush Focal Areas (SFAs) was cancelled on October 11, 2017. The BLM determined the proposal to withdraw 10 million acres was unreasonable in light of the data that showed that mining affected less than 0.1 percent of Greater Sage-Grouse habitat across its occupied range.

On March 29, 2017, the Secretary of the Interior (Secretary) issued Secretarial Order (SO) 3349, *American Energy Independence*, ordering DOI agencies to reexamine practices "to better balance conservation strategies and policies with the equally legitimate need of creating jobs for hard-working American families."

On June 7, 2017, the Secretary issued SO 3353 with a purpose of enhancing cooperation among 11 western states and the BLM in managing and conserving Greater Sage-Grouse. SO 3353 directed an Interior Review Team, consisting of the BLM, USFWS, and US Geological Survey (USGS), to coordinate with the Sage-Grouse Task Force Team and review the 2015 Greater Sage-Grouse plans and associated policies to identify provisions that will maintain healthy Greater Sage-Grouse populations but may require modification to make the plans more consistent with the individual state plans and better balance the BLM's multiple-use mission as directed by SO 3349.

On August 4, 2017, the Interior Review Team submitted its "Report in Response to SO 3353." This report made recommendations for modifying the 2015 Greater Sage-Grouse LUPA decisions and associated policies to better align with the individual state plans and management direction. On August 4, 2017, the Secretary issued a memo to the Deputy Secretary directing the BLM to implement the recommendations found in the report.

Consistent with the report, the BLM published a Notice of Intent titled "Notice of Intent to Amend Land Use Plans Regarding Greater Sage-Grouse Conservation and Prepare Associated Environment

Impact Statements or Environmental Assessments" in the *Federal Register* on October 11, 2017. During this public scoping period, the BLM sought public comments on a list of specific issues on whether all, some, or none of the 2015 Greater Sage-Grouse plans should be amended, what additional issues should be considered, and if plans should be completed at the state level rather than at the national level. In addition, the BLM recognized that Greater Sage-Grouse is a state-managed species dependent on sagebrush steppe habitats managed in partnership between federal, state, and local authorities and that input from state governors would be given significant weight when considering what management changes should be made and in ensuring consistency with the BLM's multiple-use mission during a land use plan amendment process.

On March 31, 2017, the United States District Court for the District of Nevada held that the BLM violated the National Environmental Policy Act NEPA) by failing to prepare a supplemental Environmental Impact Statement (EIS) for the designation of SFA in the 2015 Nevada and Northeastern California Greater Sage-Grouse Resource Management Plan Amendment in Nevada. In 2018, the BLM published the Nevada and Northeastern California Greater Sage-Grouse Proposed Resource Management Plan Amendment (2018 PRMPA) and Final Environmental Impact Statement (2018 Final EIS) in response to the Court's order and evaluated the SFA designation and provided the public with an opportunity to review and comment on that evaluation. The BLM also provided the public with an opportunity to review and comment on the designation of Greater Sage-Grouse habitat management areas (HMAs), such as priority, general, and other, which provide a landscape-level reference of relative Greater Sage-Grouse habitat as determined by landscape characteristics and the likelihood of Greater Sage-Grouse occurrence (Coates et al.).

The 2018 Final EIS incorporated by reference the 2015 Nevada and Northeastern California Greater Sage-Grouse Final EIS (BLM 2015a; 2015 Final EIS) and incorporated by reference all the descriptions of the affected environment and impacts analyzed in the 2015 Final EIS and subsequently Approved Nevada and Northeastern California Greater Sage-Grouse Land Use Plan Amendment and Record of Decision (BLM 2015b; 2015 ARMPA/ROD). The 2018 RMPA/Final EIS also incorporated by reference the 2016 Sagebrush Focal Area Withdrawal Draft EIS (BLM 2016; 2016 SFA Draft EIS). The 2018 Final EIS was prepared to analyze the impacts associated with aligning the 2015 Final EIS with the State of Nevada and State of California's Greater Sage-Grouse management strategies.

Incorporation by reference and tiering provide opportunities to reduce paperwork and redundant analysis in the NEPA process. When incorporating by reference, the author refers to other available documents that cover similar issues, effects, and/or resources considered in the NEPA analysis that is being prepared. Incorporation by reference allows brief summarizations of relevant portions of other documents rather than repeating them.

During the public scoping period for the 2019 planning process, the BLM sought public comments on whether all, some, or none of the 2015 Greater Sage-Grouse plans should be amended, what issues should be considered, and if new plans should be completed at the state level rather than at the national level. The BLM specifically sought public comment on SFA designations, mitigation standards, lek buffers, disturbance and density caps, habitat boundaries to reflect new information, and reversing adaptive manage response when the BLM determines that resource conditions no longer warrant those responses. In addition, the BLM recognized that the Greater Sage-Grouse is a state-managed species that depends on sagebrush steppe habitats managed in partnership by federal, state, and local authorities.

Input from governors weighed heavily when the BLM considered what management changes should be made and when ensuring consistency with the BLM's multiple-use mission.

After reviewing comments received during the public scoping period, the BLM proposed the Draft EIS on May 4, 2018 and ultimately issued the Final EIS on December 6, 2018. Through the notice and comment process, the BLM was able to accomplish the objectives set forth in SO 3353 and remedy inconsistencies that existed in the 2015 LUPAs. Below is a summary of some of the issues raised during the Draft EIS and addressed during the Final EIS.

Further, in the 2018 Draft EIS, the BLM again requested public comments on a number of issues, including the BLM's approach to compensatory mitigation. In response to the comments received on the 2018 Draft EIS, and information supplied by the states about how to align with their compensatory mitigation laws and policies, the 2018 Final EIS clarified the BLM's approach to compensatory mitigation in its Proposed Plan Amendment. Through this Draft Supplemental EIS (DSEIS), the BLM now seeks additional comment from the public on compensatory mitigation.

This DSEIS also addresses and clarifies the BLM's reliance on scientific information, including how the BLM addresses the recommendation and objectives in the National Technical Team (NTT) and Conservation Objectives Team (COT) Reports. The BLM, the USFWS, states and other federal agency partners prepared the NTT (2011) and the COT (2013) reports to identify range-wide Greater Sage-Grouse conservation objectives and conservation measures that would: (1) inform the USFWS 2015 listing decision under the Endangered Species Act and for partnersand, (2)provide guidance for the BLM to consider through the NEPA and land use planning process, which the BLM completed in 2015 and 2019, and again in this DSEIS. The NTT and COT Reports constituted starting points for the BLM to consider in at least one alternative to be considered through the NEPA and land use planning process. They are not compendiums that, standing alone, represent best available science. The NTT and COT reports do not address, or even attempt to address, how the implementation of their Greater Sage-Grouse conservation measures would affect other uses of public lands—such as recreation, fluid mineral development, mining, and livestock grazing. Moreover, the NTT and COT reports do not quantify, or even attempt to quantify, the Greater Sage-Grouse conservation benefits of each respective conservation measure.

At the time that the NTT and COT Reports were being developed, the BLM, USFWS, and state agencies had not completely developed or established the robust regulatory programs to conserve Greater Sage-Grouse that exist today.

In 2015, the BLM developed an action alternative around the NTT report. In the 2018 Final EIS, the BLM incorporated this analysis by reference. The BLM also coordinated with the USFWS during the process culminating in the 2019 RODs to make sure that the conservation measures from the NTT and COT informed the management alignment alternative (**Appendix B).** Including the USFWS as a cooperating agency during the 2019 planning process ensured that BLM used the same materials and newest science that the USFWS uses/recommends for Greater Sage-Grouse management.

In 2018, the Environmental Protection Agency (EPA) provided comments on the Draft RMPAs/EISs. Specifically, they provided seven comments on the Nevada and Northeastern California Draft RMPA/EIS, six comments on the Utah Draft RMPA/EIS, six comments on the Idaho Draft RMPA/EIS, three comments on the Wyoming Draft RMPA/EIS, six comments on the Oregon Draft RMPA/EIS, and five

comments on the Colorado Draft RMPA/EIS. The EPA's comments included suggestions and questions regarding lek buffers, recent science, mitigation, adaptive management, and fluid minerals. The BLM responded to each of the EPA's comments and made corrections and/or changes in the 2018 Final EISs. The complete EPA comment analysis can be found in the administrative record.

This DSEIS also clarifies how the BLM considered comments, including those of other federal agencies and experts, when developing its 2019 planning decisions (**Appendix C**). For example, in the Nevada and Northeastern California Sub-region the BLM addressed comments related to Data and Science, Adaptive Management, Fire and Invasives, Greater Sage-Grouse Habitat Management Areas, lek buffers, SFAs and Mitigation, among other topics.

1.2 PURPOSE OF AND NEED FOR ACTION

In the Federal Land Policy and Management Act (FLPMA), Congress provided the BLM with discretion and authority to manage public lands for multiple use and sustained yield and declared it the policy of the United States to, consistent with the laws governing the administration of the public lands, coordinate planning activities with the land use planning and management programs of other federal, state, and local governments. Further, FLPMA specifically provides that it neither enlarges nor diminishes the authority of the states in managing fish and wildlife. As the sovereign entities with the lead role in managing game species, including Greater Sage-Grouse, states play a critical role in conserving the Greater Sage-Grouse and its habitat.

In the 2019 Planning effort the BLM modified its approach to managing Greater Sage-Grouse habitat in land use plans by (1) enhancing cooperation and coordination with the States of Nevada and California, (2) aligning with the DOI and the BLM policies issued since 2015, and (3) incorporating appropriate management flexibility and adaptation to better align with the state of Nevada's conservation plan and California's management strategies. The BLM achieved these goals while maintaining the vast majority of Greater Sage-Grouse protections it incorporated into its land use plans in 2015. By implementing these land use plan conservation measures and continuing to exercise its discretion to approve future project proposals under appropriate terms and conditions or deny them where appropriate, the BLM can adequately protect Greater Sage-Grouse and its habitat while meeting its general obligation under FLPMA to manage public lands under principles of multiple use and sustained yield.

On October 16, 2019, the US District Court for the District of Idaho issued an order granting a motion for a preliminary injunction filed by Plaintiffs Western Watersheds Project, WildEarth Guardians, Center for Biological Diversity, and Prairie Hills Audubon Society. The court found that the Plaintiffs were likely to succeed on the merits of their claims that the BLM violated the National Environmental Policy Act (NEPA) when adopting the 2019 Greater Sage-Grouse plans.

The BLM has prepared this DSEIS to review its previous NEPA analysis, clarify and augment it where necessary, and provide the public with additional opportunities to review and comment. The BLM's DSEIS, including any comments that the agency receives, will help the BLM determine whether its 2015 and 2019 land use planning and NEPA processes have sufficiently addressed Greater Sage-Grouse habitat conservation or whether the BLM should initiate a new land use planning process to consider additional alternatives or new information. To inform this decision the BLM has prepared this DSEIS to address four specific issues: the range of alternatives, need to take a "hard look" at environmental impacts, cumulative effects analysis, and the BLM's approach to compensatory mitigation.

1.3 PLANNING AREA AND CURRENT MANAGEMENT

The planning area boundary includes all lands regardless of jurisdiction in the Nevada and Northeastern California Sub-region (see **Figure 1-1**). **Table 1-1**, Land Management in the Planning Area, outlines the number of surface acres that are administered by specific federal agencies, states, and local governments and lands that are privately owned in the planning area. It includes other BLM-administered lands that are not allocated as Greater Sage-Grouse HMAs (i.e., priority, general, and other) and do not contain habitat for Greater Sage-Grouse. The planning area includes the BLM Nevada District Offices of Battle Mountain, Carson City, Elko, Ely, and Winnemucca and the BLM California Field Offices of Applegate (Alturas and Surprise) and Eagle Lake. The 2015 ARMPA did not establish any additional management for lands that are not identified as Greater Sage-Grouse HMAs, which would continue to be managed according to the existing, underlying land use plan for the areas. BLM-administered lands in HMAs within the planning area are where management direction described in this document would be applied (the decision areas; see **Figures 2-1a** and **2-1b** [**Appendix A**]). **Figures 1-2a** and **1-2b** (**Appendix A**) display where HMAs reside across the planning area for all lands regardless of jurisdiction.

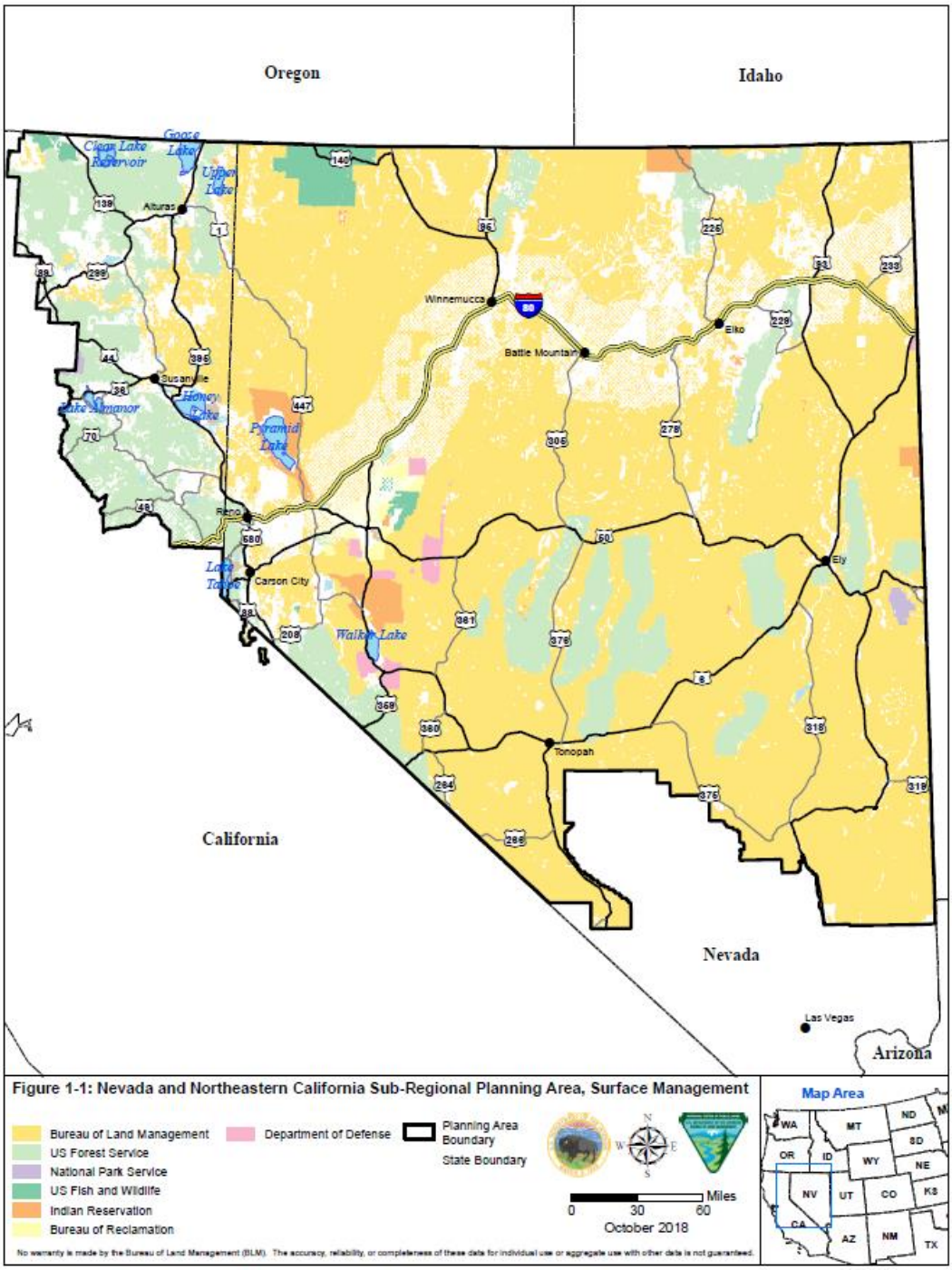
These broad HMA maps are necessary at the resource management planning scale in order to include a variety of important Greater Sage-Grouse seasonal habitats and movement corridors that are spread across geographically diverse and naturally fragmented landscapes. Greater Sage-Grouse use various habitat types to meet seasonal needs throughout the year and the resulting mosaic of habitats (e.g., breeding, nesting, early brood-rearing, late brood-rearing, and winter) can encompass large areas. Broad habitat maps increase the likelihood that all seasonal habitats (including transition and movement corridors) are included. While areas of non-habitat, in and of themselves, may not provide direct habitat value for Greater Sage-Grouse (e.g., canyons, water bodies, and human disturbances), these areas maybe crossed by birds when moving between seasonal habitats; therefore, these HMAs are not strictly about managing habitat but are about providing those large landscapes that are necessary to meet the life-stage requirements for Greater Sage-Grouse. These areas include habitats that may not meet the Greater Sage-Grouse seasonal habitats described in the Habitat Objectives for Greater Sage-Grouse (Table 2-2) in the 2015 Final EIS. These areas meet Greater Sage-Grouse habitat needs by maintaining large, contiguous expanses of relatively intact sagebrush vegetation community.

Table 1-1
Land Management in the Planning Area

Surface Land Management	Total Surface Land Management Acres
BLM	45,424,700
Forest Service	9,787,300
Private	12,111,700
Indian reservation	942,600
USFWS	806,700
Department of Energy	2,600
State	232,500
National Park Service	115,000
Bureau of Reclamation	431,000
Local government	17,800
Department of Defense	402,400
Total acres	**70,274,300**

Source: BLM GIS 2015

Figure 1-1
Planning Area



1.4 2019 Issues Development

1.4.1 Issues and Related Resource Topics Identified Through Scoping as Part of the 2019 Planning Process

When deciding which issues to address related to the purpose and need, BLM considers points of disagreement, debate, or dispute regarding an anticipated outcome from a proposed action. Issues are based on anticipated environmental effects. As such, issues can help shape the proposal and alternatives.

The BLM used internal, agency, and public scoping to identify issues to consider in the environmental analysis. A summary of the scoping process is presented in a report titled "Potential Amendments to Land Use Plans Regarding Greater Sage-Grouse Conservation Scoping Report" (BLM 2018a; https://goo.gl/FopNgW).

When determining whether to retain an issue for more detailed analysis in the 2018 RMPA/Final EIS, the interdisciplinary team considered, among other things, the following:

- The environmental impacts associated with the issue, and the threats to species and habitat associated with the issue, are central to or of critical importance to development of a Greater Sage-Grouse management plan.
- A detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives.
- The environmental impacts associated with the issue are a significant point of contention among the public or other agencies.
- Whether there are potentially significant impacts on resources associated with the issue.

Ultimately, it was important for decision-makers and the public to understand the impacts that each of the alternatives would have on specific resources; therefore, the BLM used resource topics as a heading to indicate which resources would be affected by a potential management change. Importantly, resource topics helped organize the discussions of the affected environment (**Chapter 3**) and environmental consequences (**Chapter 4**).

The sections below lay out how issues raised during scoping, as well as related resource topics, were considered in the 2018 RMPA/Final EIS. Generally, they fell into the following categories:

- Issues and related resource topics retained for further consideration in the 2018 RMPA/Final EIS. These were issues raised during scoping that were retained in the 2018 RMPA/Final EIS and for which alternatives were developed to address the issues. In some cases, the resolution in the alternatives were previously analyzed in the 2015 Final EIS. In other cases, additional analysis was needed in the 2018 RMPA/Final EIS. Because the issues were analyzed under resource topics in 2015, the resource topics corresponding with those retained for further analysis were also considered in the 2018 RMPA/Final EIS. Just like issues, resource topics may have been analyzed in the 2015 Final EIS for those decisions included in the 2018 RMPA/Final EIS.
- Clarification of decisions in the 2015 ARMPA/ROD. These are decisions or frameworks in the 2015 ARMPA/ROD that required clarification as to their application or implementation. No new analysis was required, as the intentions behind the decisions were analyzed in the 2015 Final EIS.

- Issues and resource topics not carried forward for additional consideration or analysis. These are issues brought up during scoping that are were carried forward in the 2018 RMPA/Final EIS. While some of these issues are considered in the 2018 RMPA/Final EIS, they did not require additional analysis because they were analyzed in the 2015 Final EIS. Others were not carried forward in the 2018 RMPA/Final EIS because they did not further the purpose of aligning with the state's conservation plan or management strategies. Similar to issues, there were resource topics that were not retained for further analysis in the 2018 RMPA/Final EIS. This is because either they are not affected by the changes proposed in Chapter 2 of the 2018 RMPA/Final EIS or because the effect was analyzed in the 2015 Final EIS.

Issues and Related Resource Topics Retained for Further Consideration in the 2018 RMPA/EIS

Table 1-2 summarizes those issues identified through scoping for the 2019 planning process that were retained for consideration and additional discussion in **Chapters 3** and **4**.

Based on the issues identified in **Table 1-2** that were not previously analyzed, the resource topics that had the potential to be impacted were: Greater Sage-Grouse, vegetation (including invasives and special status vegetation), land use and realty, renewable energy, minerals and energy, socioeconomics, livestock grazing, and comprehensive travel management. These resource topics, therefore, were carried forward for detailed analysis.

Table 1-2 identifies the corresponding resource topics to which the issues relate. The level of detail in the description of each resource topic and the effects from implementing any of the alternatives also are described in **Chapters 3** and **4**.

Table 1-2
Issues and Related Resource Topics

Issues	Resource Topics Related to the Issues
Modifying Habitat Management Area Designations • Need for adjusting Greater Sage-Grouse Habitat Management Areas (HMAs) so that they reflect the best available science based on updates to habitat data and use modeling (Coates et al. 2016) and are consistent with HMAs identified by the State of Nevada and recommended by CDFW. This would provide consistency in management across jurisdictions and to third parties operating on public and state or private lands in the Nevada and Northeastern California Subregion. • Integration of flexibility into the plans to be able to adjust HMA designations (and their associated allocations), based on the best available science, through plan maintenance or amendment, as appropriate. • Maintaining all HMAs as identified in the 2015 ARMPA/ROD, and SFAs, which should be provided with the most protections.	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management

Issues	Resource Topics Related to the Issues
Removing Sagebrush Focal Area Designations • Address eliminating the SFA designation and the cancellation of the proposed withdrawal of SFAs and the reasoning for the cancellation – Analyze the inclusion and removal of SFAs, in response to the March 31, 2017, United States District Court for the District of Nevada court order. • Is this habitat designation (i.e., SFA) needed to adequately maintain conservation of Greater Sage-Grouse HMAs?	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management
Adaptive Management • Ensure federal, state, and local partners are part of the causal factor analysis process • Lack of flexibility with implementing and removing hard trigger adaptive management responses • Better alignment with DOI guidance on implementation of the adaptive management process • Incorporate best available science including local data and information into the adaptive management strategy • Utilize collaborative processes with stakeholders, appropriate state and local agencies, and authorized land users when developing and implementing management responses to any trigger met or surpassed	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management
Allocation Exception Process • Clarify and make consistent the various exception allocation processes • Verify through ground-truthing (Greater Sage-Grouse habitat suitability assessments, such as Stiver et al. 2015), the utilization of landscape-scale mapping of priority habitat management area (PHMA), general habitat management area (GHMA), and other HMAs (OHMA) in regards to the application of land use plan allocations and stipulations • Address restrictions on actions related to public health and safety, existing infrastructure, and administrative functions that serve a public purpose • Address inconsistencies with existing federal legislation and the 2015 ARMPA/ROD that include land tenure adjustments, including, but not limited to, disposals, exchanges, transfers, and recreation and public purposes actions	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management
Mitigation • Alignment with the State of Nevada's mitigation strategy to the extent allowable by federal law on Nevada BLM-administered lands only • Defer to the State of Nevada's mitigation strategy to the extent allowable by federal law and regulation on Nevada BLM-administered lands only • Consider and analyze the State of Nevada's and California's recommendations for project level mitigation in relevant NEPA documentation • Ensure consistency in tracking and reporting changes to Greater Sage-Grouse habitat quality and quantity • Alignment with updated BLM policy regarding compensatory mitigation (IM 2018-093)	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management

Issues	Resource Topics Related to the Issues
Seasonal Timing Restrictions • Alignment with State of Nevada's conservation plan and management strategies with the State of California, to the greatest extent possible • Consider exceptions and/or modifications to Greater Sage-Grouse seasonal timing restrictions to allow for beneficial or neutral projects as recommended by the State of Nevada and California consistent with its conservation plan and/or mitigation strategies to occur in a timely manner • Seasonal timing restrictions need to be adjusted to allow for public health and safety concerns and time sensitive administrative functions that serve a public purpose to be addressed without delay	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management
Modifying Habitat Objectives • Consideration of site potential, based on such factors as ecological site descriptions, state and transition models, etc. • Consistency with State of Nevada's desired habitat conditions • Incorporation of the best available current science supporting modifications • Clarify that the Greater Sage-Grouse Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) are actually desired outcomes expressed as goals consistent with BLM Planning Handbook (H-1601-1)	• Greater Sage-Grouse • Vegetation • Land Use and Realty • Renewable Energy • Minerals and Energy • Socioeconomics • Livestock Grazing • Comprehensive Travel Management

Clarification of Planning Decisions in the 2015 ARMPA/ROD

The following issues identified in existing planning decisions in **Table 1-3** were raised during scoping for the 2019 planning process. These issues required clarification to language in the 2015 ARMPA/ROD but did not require new analysis. The clarifying language for these planning decisions is displayed in this planning document to communicate how these issues were addressed through plan maintenance, policy, or implementation.

Table 1-3
Clarification Issues

Clarification Issue	Clarifications Addressed through Plan Maintenance, Policy, or Implementation
Modifying Lek Buffers Clarification regarding the application of lek buffer-distances	*Plan Maintenance* - Management Decisions SSS 2(D) and SSS 3(C) from the 2015 ARMPA/ROD have been clarified to resolve conflicting statements regarding how the BLM would "apply" lek buffers contained in the USGS Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review, Open File Report 2014-1239* (Mainer et al. 2014). Management Decisions SSS 2(D) and SSS 3(C) have been revised to read as follows: *In undertaking BLM management actions [in PHMA and GHMA], and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM would utilize the lower end of the interpreted range of lek buffer-distances and guidance identified in Mainer et al. (2014) to establish the evaluation area around leks that would be used to analyze impacts during project-specific NEPA, including scientifically justifiable departures based on local data, topography, and other factors, in accordance with* ***Appendix D****.* **Appendix D** has also been revised to reflect this clarified decision language.

Clarification Issue	Clarifications Addressed through Plan Maintenance, Policy, or Implementation
Changing Requirements for Required Design Features Clarify the application of required design features and opportunities to deviate from them	*Plan Maintenance* - **Appendix E** includes a required design features (RDFs) worksheet that BLM Nevada and Northeastern California field and district offices would complete for all proposed activities authorized in PHMA, GHMA, and OHMA. This worksheet clearly defines the rationale for dismissing certain RDFs when they are not appropriate for specific proposed activities.
Fire and Invasives Provide the necessary prioritization of all three aspects of fire management: pre-suppression, suppression, and rehabilitation and find ways to expedite on-the-ground treatments to address this present and widespread threat in the Nevada and Northeastern California Sub-region	*Policy* - When the Great-Basin-Wide Programmatic Environmental Impact Statements (PEISs) for Fuel Breaks and to Reduce the Threat of Wildfire and Support Rangeland Productivity and any other programmatic analysis associated with vegetation treatments are completed, BLM Nevada and California would issue statewide policies that would instruct BLM field and district offices to incorporate by reference the analysis contained in the PEISs for on-the-ground environmental analysis, in an effort to expedite on-the-ground activities that would address the present and widespread threat of fire and invasives in the Nevada and Northeastern California Sub-region. The Draft PEISs are tentatively scheduled for publication in December 2018, with Final PEISs tentatively scheduled for publication in June/July 2019. The PEISs would not modify any proposed land use plan decisions (including HMA designations) specified in this RMPA/EIS.
Increase Opportunities for Outcome-Based Grazing Identify and complete a number of authorizations to support the development of rigorous and defensible outcome-based grazing	*Implementation* - BLM Nevada and California would continue to pursue outcome-based grazing initiatives that would exhibit a new management paradigm that BLM managers and livestock operators can use to establish management practices that can achieve specific management objectives that respond to changing, on-the-ground conditions such as wildfires, high moisture years, or drought. This would better ensure healthy rangelands, high-quality wildlife habitat, and economically sustainable ranching operations.
Land Health Assessments and Habitat Objectives Management Decisions LG 5 within the existing 2015 ARMPA/ROD is inconsistent with 43 CFR 4160.1. References of this decision contained in Management Decisions LG 6 and LG 10 would be removed and these management decisions would be modified.	*Plan Maintenance* - Management Decision LG 5 (page 2-25 through 2-26, ARMPA), as written, is not consistent with existing BLM grazing regulations (43 CFR 4160.1) or recent policies (WO Instruction Memorandum 2018-023), as it provides direction to implement interim management strategies until appropriate modifications are incorporated through the permit renewal process (if results from a land health assessment indicate that Greater Sage-Grouse habitat objectives are not met and grazing is a causal factor). This management decision, however, does not identify that these interim management strategies need to be within the existing terms and conditions of a grazing permit in order to implement them immediately. Under 43 CFR 4160.1 (existing BLM grazing regulations), the BLM must issue a proposed/final decision on any affected applicant, permittee or lessee, and interested public when modifying a grazing permit. If the interim management strategies are within the existing terms and conditions of a grazing permit, they can be implemented immediately; however, if the selected interim management strategies are outside of the existing terms and conditions, the BLM would need to comply with NEPA and the decision processes provided in 43 CFR 4160. For this reason, Management Decision LG 5 would be removed, and references to Management Decision LG 5 in Management Decisions LG 6 and LG 10 would be removed and these management decisions would be modified.

Issues and Resource Topics Not Carried Forward for Additional Analysis (Scoping Issues Outside the Scope and Scoping Issues Previously Analyzed)

Issues and Related Resource Topics Not Carried Forward for Additional Analysis

The following issues were raised during scoping for the 2019 planning process and are not carried forward in this DSEIS for the same reasons. For example, population-based management is not carried forward for detailed analysis because the BLM does not manage species populations; that authority falls under the jurisdiction of the States of Nevada and California.

Because the following issues were raised during scoping and were already analyzed in the 2015 Final EIS, and no significant new information has emerged, they did not require additional analysis in the 2018 RMPA/EIS. These issues were analyzed under most resource topics in the 2015 Final EIS, and these types of impacts on these resources are described in the range of alternatives in the 2015 Final EIS. The impacts of implementing the alternatives in the 2018 RMPA/EIS were within the range of alternatives previously analyzed.

- Effects of No surface occupancy (NSO) stipulations on Greater Sage-Grouse habitat on non-BLM-administered lands
- Mitigation for oil and gas development
- Prioritization of fluid mineral leases outside of PHMA and GHMA
- Numerical noise limitations within PHMA
- Contribution of disturbance caps toward Greater Sage-Grouse conservation objectives
- Wildfire response to vegetation treatments
- Sage-Grouse Habitat Assessment Framework (Stiver et al. 2015)

Other issues were evaluated as part of the 2015 Final EIS. For the same reasons they were dismissed in the 2015 Final EIS, they were not carried forward for detailed analysis in the 2018 RMPA/EIS:

- Hunting of Greater Sage-Grouse
- Predator control[1]
- Aircraft overflights in PHMA and GHMA[2]

Resource Topics Not Carried Forward for Additional Analysis

The resource topics below are dismissed from detailed analysis. While these resource topics may have impacts related to Greater Sage-Grouse conservation that were analyzed in the 2015 Final EIS, they were dismissed from detailed analysis because they had no potentially significant impacts from actions proposed in the 2018 RMPA/EIS:

[1]While the BLM does not have the authority to carry out certain predator control actions (such as permitting take permits), it is committed to working with partners who do, particularly in degraded habitat, such as recovering burns and areas of pinyon and/or juniper encroachment, where predators are having a disproportionate impact on local Greater Sage-Grouse populations.

[2] Military aircraft operations were outside the scope of the 2018 RMPA/EIS. The 2018 RMPA/EIS did not apply to aircraft activities that are under the jurisdiction of the Federal Aviation Administration or the Department of Defense.

- Geology
- Indian trust resources
- Noise
- Air quality and visibility
- Special designations (e.g., areas of critical environmental concern, research natural areas, wilderness, wilderness study areas, wild and scenic rivers, and national scenic and historic trails)
- Environmental justice
- Wildland fire and fire management
- Wild horses and burros
- Recreation
- Visual resources
- Water resources
- Cultural and heritage resources
- Lands with wilderness characteristics

1.5 ITEMS TO BE CLARIFIED IN THIS DSEIS

The items considered in this DSEIS are related to the analysis in the 2018 Final EIS. These items are:

- clarifying the range of alternatives (including how the BLM considered the full range of the 2015 alternatives in the 2019 planning process),
- taking a hard look and using the best available science (including clarified effects analysis, how the 2015 and 2019 Final EISs addressed the NTT and COT recommendations and conservation measures) (**Appendix B**),
- clarifying that the cumulative effects analysis was done at the range wide level and organized by WAFWA Management Zone (MZs) Updated language also highlights why WAFWA MZs were used,
- an updated Reasonably Foreseeable Future Actions

1.6 RELATIONSHIP TO OTHER POLICIES, PLANS, AND PROGRAMS

The BLM recognizes the importance of state and local plans. The BLM would work to be consistent with or complementary to the management actions in these plans when possible to the extent consistent with the laws governing the administration of public lands.

1.6.1 State Plans

State plans considered during this planning effort include the following:

- Nevada's 2016-2021 Statewide Comprehensive Outdoor Recreation Plan (SCORP)—Assessment and Policy Plan (Nevada Division of State Parks and Department of Conservation and Natural Resources 2016-2020)
- Nevada Comprehensive Preservation Plan (Nevada State Historic Preservation Office 2012–2020)

- Sustainable Preservation: California's Statewide Historic Preservation Plan, 2013–2017 (California State Parks 2013)
- Nevada Department of Wildlife-Wildlife Action Plan (2013)
- Greater Sage-Grouse Conservation Plan for Nevada and Eastern California (NDOW 2004)
- Nevada Sage-Grouse Conservation Strategy (State of Nevada 2001, 2004, 2012)
- Nevada Sage-Grouse Conservation Plan (State of Nevada 2014, as amended)
- Nevada's Coordinated Invasive Weed Strategy (Nevada Weed Action Committee 2000)
- Nevada Division of State Lands, Lands Identified for Public Acquisition (Nevada Department of Conservation & Natural Resources 1999)
- State of Nevada Drought Plan (Nevada Department of Conservation and Natural Resources 2012)
- Nevada Division of State Lands, Nevada Statewide Policy Plan for Public Lands (Nevada Department of Conservation & Natural Resources 1985)

1.6.2 Local Plans

Local land use plans considered during this planning effort include the following:

- Carson City Comprehensive Master Plan, Nevada (Carson City 2006)
- Churchill County Master Plan, Nevada (Churchill County 2015)
- Churchill County Water Resource Plan, Nevada (Churchill County 2007)
- City of Caliente Master Plan, Nevada (City of Caliente 2011)
- Douglas County Comprehensive Master Plan, Nevada (Douglas County 2012)
- Douglas County Open Space Plan, Nevada (Douglas County 2007)
- Elko County, Nevada Greater Sage-Grouse Management and Conservation Strategy Plan (September 2012)
- Elko County General Open Space Plan, Nevada (Elko County 2003)
- Elko County Public Lands Policy Plan, Nevada (Elko County 2008)
- Elko County Water Resource Management Plan, Nevada (Elko County 2007)
- Esmeralda County Master Plan, Nevada (Esmeralda County 2011)
- Esmeralda County Public Lands Policy Plan, Nevada (Esmeralda County 2013)
- Eureka County Master Plan, Nevada (Eureka County 2010)
- Humboldt County Master Plan, Nevada (Humboldt County 2002)
- Humboldt County Master Plan Open Space Element Amendment, Nevada (Humboldt County 2003)
- Lander County Master Plan, Nevada (Lander County 2010)
- Lander County Policy Plan for Federally Administered Lands, Nevada (Lander County 2005)
- Lander County Water Resources Plan, Nevada (Lander County 2011)
- Lassen County Fire Safe Plan, California (Lassen County 2012)
- Lassen County General Plan, California (Lassen County 1999)
- Lincoln County Master Plan, Nevada (Lincoln County 2007)

- Lincoln County Open Space and Community Lands Plan, Nevada (Lincoln County 2011)
- Lincoln County Public Lands Policy Plan, Nevada (Lincoln County 2015)
- Lyon County Comprehensive Master Plan, Nevada (Lyon County 2010)
- Modoc County General Plan, California (Modoc County 1988)
- Nye County Comprehensive Master Plan, Nevada (Nye County 2011)
- Pershing County Master Plan, Nevada (Pershing County 2002)
- Pershing County Natural Resources Management Plan: Natural Resources and Federal or State Land Use, Nevada (Pershing County 2010)
- Shasta County General Plan, California (Shasta County 2004)
- Siskiyou County General Plan, California (Siskiyou County 2010)
- Storey County Master Plan, Nevada (Storey County 1994)
- Title 7 of the Nye County Code (Comprehensive Land Use and Management Plan for Federal and State Lands within Nye County), Nevada (Nye County 2009)
- Tri-Party Framework for Interactions to Address Public Lands Issues in Nye County, Nevada (includes Nye County, the BLM, and Forest Service), Nevada (Nye County 1996)
- Truckee Meadows Regional Plan (Washoe County Only), Nevada (TMRPA 2007)
- Washoe County Comprehensive Plan, Nevada (Washoe County 2005a)
- Washoe County Open Space & Natural Resource Management Plan, Nevada (Washoe County 2008)
- Washoe County Water Resources Management Plan, Nevada (Washoe County 2005b)
- Washoe County Master Plan with Elements and Area Plans, Nevada (Washoe County, 2010, as amended)
- Washoe County Regional Open Space & Natural Resource Management Plan, Nevada (Washoe County, 2008)
- White Pine County Public Lands Policy Plan, Nevada (White Pine County 2007)
- White Pine County Water Resources Plan, Nevada (White Pine County 2006)

Chapter 2. Proposed Plan Amendment and Alternatives

2.1 Introduction

This chapter describes the eight alternatives considered during the 2019 planning processes. The 2018 Draft RMPA/Draft EIS and Proposed RMPA/Final EIS analyzed in detail a No-Action Alternative and one action alternative, the Management Alignment Alternative, while incorporating by reference the full range of alternatives evaluated in detail by the BLM in its 2015 EISs. The 2019 ARMPA/ROD also explains how the BLM considered the alternatives evaluated in the BLM's 2015 and 2018 EISs. This DSEIS likewise considers this full range of reasonable alternatives, while adding a greater level of detail about each alternative and giving the public an additional opportunity to review and comment on these eight alternatives. The full range of alternatives considered in the 2018 Final EIS is both summarized and provided in detail in the three tables in **Section 2.6**. NEPA's implementing regulations require materials to be incorporated by reference when the effect will be to cut down on bulk without impeding agency and public review of the action (40 CFR 1502. 21).

Components of Alternatives

Goals are broad statements of desired outcomes and are not quantifiable or measurable. Objectives are specific measurable desired conditions or outcomes intended to meet goals. Goals and objectives can vary across alternatives, resulting in different allowable uses and management actions for some resources and resource uses.

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

2.2 Alternatives Considered but Not Analyzed in Detail

2.2.1 Varying Constraints on Land Uses and Development Activities

During scoping, some commenters asked the BLM to consider additional constraints on land uses and ground-disturbing development activities to protect Greater Sage-Grouse habitat. These constraints are beyond those in the current management plan.[1] Other commenters, in contrast, asked the BLM to consider eliminating or reducing constraints on land uses, or incorporating other flexibilities into the BLM's implementation of RMPs, in addition to those issues that were already evaluated in the Management Alignment Alternative. The BLM considered every scoping comment and, where

[1]For example, this 2018 planning process, built upon the 2015 planning process, would continue to ensure that the BLM complies with its special status species policy, including the commitment to "implement measures to conserve [special status] species and their habitats…and promote their conservation and reduce the likelihood and need for such species to be listed pursuant to the ESA" (BLM Manual 6840, Special Status Species Management).

appropriate, incorporated these issues into the Management Alignment Alternative, following coordination with the States. Because the purpose and need for the BLM's action, building off of the 2015 ARMPA/ROD, is to enhance cooperation with the States by seeking to better align the BLM's RMPs with individual state plans and/or conservation measures, the BLM gave great weight to the States' identification of issues that warrant consideration in this planning effort.

This planning process does not revisit every issue that the BLM evaluated in the 2015 ARMPA/ROD. Instead, the BLM now addresses refinements to the 2015 ROD/ARMPA decisions, consistent with the BLM's purpose and need for the action. Accordingly, this SEIS has its foundation in the comprehensive 2015 Final EIS and ARMPA/ROD and incorporates those documents by reference—including the entire range of alternatives evaluated through the 2015 planning process:

- Alternative A would have retained the management goals, objectives, and direction specified in the BLM's and the Forest Service land and resource management plans effective prior to the 2015 ROD/ARMPA.
- Alternative B was based on the conservation measures developed by the National Technical Team planning effort in Washington Office Instruction Memorandum (IM) 2012-044. As directed in the IM, the conservation measures developed by the National Technical Team must be considered and analyzed, as appropriate, through the land use planning process and NEPA by all BLM state and field offices that contain occupied Greater Sage-Grouse habitat. Most management actions included in Alternative B would have been applied to PHMA.
- Alternative C was based on a citizen groups' recommended alternative. This alternative emphasized improvement and protection of habitat for Greater Sage-Grouse and was applied to all occupied Greater Sage-Grouse habitat. Alternative C would have limited commodity development in areas of occupied Greater Sage-Grouse habitat and would have closed or designated portions of the planning area to some land uses.
- Alternative D, which was identified as the Preferred Alternative, balanced opportunities to use and develop the planning area and protects Greater Sage-Grouse habitat based on scoping comments and input from cooperating agencies involved in the alternatives development process. Protective measures would have been applied to Greater Sage-Grouse habitat.
- Alternative E was the alternative provided by the Nevada State or Governor's offices for inclusion and analysis in the EISs. It incorporated guidance from specific state conservation strategies and emphasized management of Greater Sage-Grouse seasonal habitats and maintaining habitat connectivity to support population objectives.
- Alternative F was also based on a citizen group recommended alternative. This alternative emphasized improvement and protection of habitat for Greater Sage-Grouse and defined different restrictions for Priority Habitat Management Areas (PHMA) and General Habitat Management Areas (GHMA). Alternative F would have limited commodity development in areas of occupied Greater Sage-Grouse habitat and would have closed or designated portions of the planning area to some land uses.
- The Proposed LUPA incorporated guidance from specific State Conservation strategies, as well as additional management based on the National Technical Team recommendations. This alternative emphasized management of Greater Sage-Grouse seasonal habitats and maintaining habitat connectivity to support population objectives.

The BLM considered the entire range of alternatives from the 2015 Final EIS to identify issues meriting reconsideration, given the BLM's goal of enhancing alignment with state plans and conservation strategies. In this manner, the BLM would continue to appropriately manage Greater Sage-Grouse and its habitat through this planning effort in tandem with the 2015 ARMPA/ROD.

Further, additional constraints on land uses or development without a documented need would not meet the purpose of SO 3353. The BLM did not discover new information that would indicate that it should increase the level of conservation, management, and protection to achieve its land use plan objective. As part of the consideration of whether to amend the 2015 ARMPA/ROD, the BLM partnered with the USGS to review the best available information published since January 2015, develop an annotated bibliography of that Greater Sage-Grouse science (Carter et al. 2018; see **Section 3.1**), and incorporate the information into this EIS. In addition, SO 3353 directs the BLM to promote habitat conservation, while contributing to economic growth and energy independence. As analyzed in the 2015 Final EIS, all of the previously analyzed alternatives, including one proposing constraints stricter than the current management plan, were predicted to result in a loss of development opportunities on public lands.

2.3 Description of Draft RMPA/EIS Alternatives

2.3.1 No-Action Alternative

Under the No-Action Alternative, the BLM would not amend the current RMPs amended or revised by the 2015 ROD/ARMPA. Greater Sage-Grouse habitat would continue to be managed under current management direction. Goals and objectives for BLM-administered lands and federal mineral estate would not change. Allowable uses and restrictions would also remain the same, as they pertain to such activities as mineral leasing and development, recreation, lands and realty, and livestock grazing. This alternative also includes the designation of Sagebrush Focal Areas (SFA), which is analyzed in **Chapter 4**.

2.3.2 Management Alignment Alternative

This alternative was identified as the Preferred Alternative in the Draft RMPA/EIS and makes modifications to the No-Action Alternative to better align the BLMs management direction with the State of Nevada's Conservation Plan[2] and conservation strategies with the California Department of Fish and Wildlife (CDFW) to reach a "combination of balanced and diverse resource uses," as required by FLPMA. This alternative was also developed in a collaborative process with cooperating agencies to support conservation outcomes based on state recommendations for Greater Sage-Grouse.

The BLM continues to build upon the 2015 planning effort as envisioned in SO 3353 by collaborating with states and stakeholders to improve compatibility between federal management plans and state plans and programs, while ensuring consistency with the BLM's multiple use mission and commitment to protect Greater Sage-Grouse habitat. This enhanced cooperation between the BLM and the States would lead to improved management and coordination with states across the range of Greater Sage-

[2] The process involved in developing the State of Nevada's Greater Sage-grouse Conservation Plan (as amended) is described in pages 5 through 7 of the State plan. The State Plan is part of the State of Nevada's Sagebrush Ecosystem Program (under Nevada Revised Statutes 232.161 and 232.162) and has been approved and amended through the State of Nevada's Sagebrush Ecosystem Council, which includes ex-officio members from the BLM, US Forest Service, NRCS, and the USFWS.

Grouse. These modifications include updating and making adjustments to Greater Sage-Grouse HMA boundaries and including language that would allow the BLM to update, through plan maintenance, when appropriate, based on the most updated best available science and habitat data; removing SFA designations; incorporating new science into the adaptive management strategy and replacing predetermined hard trigger responses with a clear causal factor analysis process to determine the appropriate management responses and to address the decline in Greater Sage-Grouse populations and/or habitat; revising and simplifying an allocation exception process to allow for the consideration of projects or other actions within Greater Sage-Grouse HMA (see **Table 2-1**, Allocation Exceptions, for more detail, in the 2015 Final EIS); solidifying the BLM's commitment to defer to the most current version of the State of Nevada's Habitat Quantification Tool (HQT) to quantify disturbance calculations; and identifying that seasonal timing restrictions and modifying Greater Sage-Grouse Habitat Objectives (Table 2-2 of the 2015 Final EIS) would be addressed in coordination with state wildlife agencies and other partners. At the request of the State of Nevada, the Management Alignment Alternative in the Draft RMPA/EIS included the net conservation gain standard for compensatory mitigation that the BLM incorporated into its plans in 2015.

Consistent with the Notice of Cancellation of the BLM's application to withdraw SFAs from locatable mineral entry (82 *Federal Register* 195, October 11, 2017, p. 47248), this alternative would also remove the recommendation for withdrawal. The effects of these actions are included in **Chapter 4**.

2.3.3 Proposed Plan Amendment

The Proposed Plan Amendment represents the BLM's proposed approach for meeting the purpose and need consistent with the agencies' legal and policy mandates. The Draft RMPA/EIS was issued for a 90-day public review and comment in May 2018. In particular, the BLM asked for comment on the "net conservation gain" compensatory mitigation standard included in the 2015 plans. The BLM assessed and considered public comments, received both individually and collectively, during the public review period of the Draft RMPA/EIS. The BLM has crafted the Proposed Plan Amendment, largely based on the Preferred Alternative (Management Alignment Alternative), which was identified in the May 2018 Draft RMPA/EIS, with modifications based on review of public comments received on the Draft RMPA/EIS. In addition, special expertise input and comments received from cooperating agencies helped shape the Proposed Plan Amendment. Changes in BLM regulations, policy, and guidance were another factor taken into consideration in its development. Key policy and guidance changes center on compensatory mitigation and adaptive management. BLM responded to all substantive comments received on the 2018 Draft RMPA/EIS (Appendix G of the 2018 Draft RMPA/EIS).

At the request of the State of Nevada, the Management Alignment Alternative in the Draft RMPA/EIS included proposed management actions for compensatory mitigation based on the mitigation framework BLM incorporated into its plans in 2015; however, following extensive review of all existing regulations, orders, guidance documents, and policies the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of the public lands (IM 2018-093, Compensatory Mitigation, July 24, 2018). In addition, the Draft RMPA/EIS maintained the net conservation gain standard for compensatory mitigation actions required to offset residual impacts on public lands.

To align BLM's compensatory mitigation policy (IM 2018-093) with the 2019 planning effort, the 2018 Proposed Plan Amendment clarified that at the project level, BLM would consider compensatory

mitigation only when offered voluntarily by project proponents or when required by state statutes. Because this correction brought the 2018 Proposed Plan Amendment into alignment with existing policy and regulation, and because compensatory mitigation would be analyzed in site-specific NEPA analysis, there was no additional analysis concerning application of the mitigation standard and compensatory mitigation actions in the 2018 Proposed RMPA/Final EIS. BLM would achieve the planning-level management goals and objectives identified in the 2018 Proposed RMPA/Final EIS including achieving conservation in alignment with State goals and objectives at the landscape-level by ensuring Greater Sage-Grouse habitat impacts are offset through implementing the mitigation hierarchy as analyzed in the 2018 Proposed RMPA/Final EIS.

The BLM recognizes that Greater Sage-Grouse is a State-managed species, and, in accordance with 43 CFR 24.3(a), that State authority regarding fish and resident wildlife guides how the BLM cooperates with the State in the absence of specific, overriding federal law. Further, the BLM recognizes that state governments have established fish and wildlife agencies that are charged with the responsibility and mandate to implement state statutes for effective, appropriate, and efficient conservation and management of fish and resident wildlife species. Accordingly, the BLM coordinated with the State of Nevada to develop a memorandum of agreement (MOA) to guide the application of the mitigation hierarchy and compensatory mitigation actions for future project authorizations in Greater Sage-Grouse habitat on BLM-administered lands in Nevada.

The MOA describes the State of Nevada's policies, authorities, and programs for Greater Sage-Grouse conservation and the process regarding how the BLM would incorporate avoidance, minimization, and other recommendations from the State of Nevada necessary to improve the condition of Greater Sage-Grouse habitat consistent with RMPA goals and objectives, in one or more of the NEPA analysis alternatives. The MOA would be implemented to provide an improvement to Greater Sage-Grouse habitat at a State level (as opposed to a WAFWA Management Zone or a Field Office), in collaboration with applicable partners (e.g., federal, tribal, and state agencies). Generally, and as described in the MOA, when the BLM receives applications for projects in Greater Sage-Grouse habitat on BLM-administered lands in Nevada, the BLM would notify the State of Nevada to determine if the State requires or recommends any additional mitigation—including compensatory mitigation—under State regulations, policies, or programs related to the conservation of Greater Sage-Grouse and its habitat.

2.4 COMPARATIVE SUMMARY OF ALTERNATIVES

Table 2-1 below provides a comparison between acres designated as PHMA, GHMA, and Other Habitat Management Areas (OHMA) (managed by the BLM) between the No-Action Alternative and Management Alignment Alternative in the 2018 Proposed RMPA/Final EIS. The change in acres between these two alternatives is based on the BLM's consideration in the Management Alignment Alternative of new PHMA, GHMA, and OHMA boundaries, from the composite management categories contained within the USGS's Spatially Explicit Modeling of Annual and Seasonal Habitat for Greater Sage-Grouse (*Centrocercus urophasianus*) in Nevada and Northeastern California—an updated decision-support tool for management (Coates et al. 2016) and as adopted and modified by the State of Nevada on December 11, 2015.

Between the two alternatives, no allocation decisions, with the exception of the recommendation for withdrawal in SFAs, would change. Acres of PHMA, GHMA, and OHMA vary between alternatives.

Table 2-1
Comparative Summary of Alternatives in the 2018 Proposed RMPA/Final EIS

		No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Comparative Summary of HMA (Acres)				
PHMA (see Figures 2-1a and 2-1b [Appendix A])		9,309,800 acres (2,797,400 portion of PHMA that is designated as SFA)	9,265,800 acres	9,265,800 acres
GHMA (see Figures 2-1a and 2-1b)		5,720,700 acres	5,748,000 acres	5,748,000 acres
OHMA (see Figures 2-1a and 2-1b)		5,876,500 acres	4,868,900 acres	4,868,900 acres
Comparative Summary of Allocations				
Land Tenure (see Figures 2-12a and 2-12b)	Retain	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA
	Dispose	OHMA	OHMA	OHMA
Solar (see Figures 2-9a and 2-9b)	Open	—	—	—
	Avoidance	—	—	—
	Exclusion	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA
Wind (see Figures 2-8a and 2-8b)	Open	OHMA	OHMA	OHMA
	Avoidance	GHMA	GHMA	GHMA
	Exclusion	PHMA	PHMA	PHMA
Minor ROWs (see Figures 2-11a and 2-11b)	Open	OHMA, GHMA	OHMA, GHMA	OHMA, GHMA
	Avoidance	PHMA	PHMA	PHMA
	Exclusion	—	—	—
Major ROWs (see Figures 2-10a and 2-10b)	Open	OHMA	OHMA	OHMA
	Avoidance	PHMA, GHMA	PHMA, GHMA	PHMA, GHMA
	Exclusion	—	—	—
Fluid Minerals (Oil, Gas, and Geothermal) (see Figures 2-4a and 2-4b)	Open with Standard Stipulations	OHMA	OHMA	OHMA
	Open with Minor Stipulations	GHMA	GHMA	GHMA
	Open with Major Stipulations	PHMA	PHMA	PHMA
Locatable Minerals (see Figures 2-5a and 2-5b)	Open	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA
	Recommended for Withdrawal	Portion of PHMA that is SFA is Recommend for Withdrawal	—	—
Salable Minerals (see Figures 2-6a and 2-6b)	Open	GHMA, OHMA	GHMA, OHMA	GHMA, OHMA
	Closed	PHMA	PHMA	PHMA
Non-Energy Leasable Minerals (see Figures 2-7a and 2-7b)	Open	GHMA, OHMA	GHMA, OHMA	GHMA, OHMA
	Closed	PHMA	PHMA	PHMA

		No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Comprehensive Travel Management (see Figures 2-13a and 2-13b)	Open	OHMA	OHMA	OHMA
	Limited	PHMA, GHMA	PHMA, GHMA	PHMA, GHMA
	Closed	—	—	—
Livestock Grazing (see Figures 2-3a and 2-3b)	Available	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA	PHMA, GHMA, OHMA
	Not Available	—	—	—

*Under the Management Alignment Alternative and the Proposed Plan Amendment, site specific projects would not need to conform to these allocation decisions if they meet one of the criteria outlined under the "Allocation Exception Process" management direction.

2.5 DETAILED DESCRIPTION OF ALTERNATIVES CONSIDERED DURING THE 2019 PLANNING PROCESS

BLM considered a range of alternatives when responding to Secretarial Order 3353 to align BLM's Greater Sage-Grouse management with State plans and management strategies. Six alternatives were analyzed in detail during the 2015 planning process and two were analyzed in detail during the 2019 planning process. BLM incorporated the 2015 alternatives into the 2019 process for a total of eight alternatives evaluated in detail.

The following three tables illustrate the extent of alternatives considered during the 2019 land use planning effort. **Table 2-2a** is a summary of the alternatives considered in detail and considered but not analyzed in detail during the 2019 planning effort. **Table 2-2a** provides a brief description of each alternative for making easy comparisons between alternatives.

Table 2-2b describes in detail the new alternatives developed to address the issues raised during scoping for the 2019 planning effort. Because the 2019 effort was focused on aligning BLM Greater Sage-Grouse management with State plans and management strategies, the issues were more focused and therefore there were only two analyzed in detail.

Table 2-2c describes in detail the alternatives developed during the 2015 planning effort that were also considered in the most recent Greater Sage-Grouse land use planning process. **Table 2-2c** is considerably longer because the 2015 process addressed many more issues than the focused 2019 planning effort.

Table 2-2a
Alternatives Considered during the 2019 Planning Process

Nevada and Northeastern California Planning Document	Document Date	Alternative Title	Analysis Level	Alternative Description
Alternatives Considered During the 2015 and 2019 Planning Processes				
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative A	Fully Analyzed	Alternative A would have retained the management goals, objectives and direction specified in the BLM RMPs and the Forest Service land and resource management plans effective prior to the 2015 ROD/ARMPA.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative B	Fully Analyzed	Alternative B was based on the conservation measures developed by the National Technical Team planning effort in Washington Office IM 2012-044. As directed in the IM, the conservation measures developed by the National Technical Team must be considered and analyzed, as appropriate, through the land use planning process and NEPA by all BLM state and field offices that contain occupied Greater Sage-Grouse habitat. Most management actions included in Alternative B would have been applied to PHMA.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative C	Fully Analyzed	Alternative C was based on a citizen group's recommended alternative. This alternative emphasized improvement and protection of habitat for Greater Sage-Grouse and was applied to all occupied Greater Sage-Grouse habitat. Alternative C would have limited commodity development in areas of occupied Greater Sage-Grouse habitat and would have closed or designated portions of the planning area to some land uses.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative D	Fully Analyzed	Alternative D, which was identified as the Preferred Alternative in the Draft RMPA/EIS, balanced opportunities to use and develop the planning area and protects Greater Sage- Grouse habitat based on scoping comments and input from cooperating agencies involved in the alternatives development process. Protective measures would have been applied to Greater Sage-Grouse habitat.

Nevada and Northeastern California Planning Document	Document Date	Alternative Title	Analysis Level	Alternative Description
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative E	Fully Analyzed	Alternative E was based on the State of Nevada's Conservation Plan for Greater Sage-Grouse in Nevada and would apply to all BLM and Forest Service administered lands in Nevada. The State of California did not submit a proposal for a complete alternative and as such, Alternative E would only apply to BLM and Forest Service administered lands in Nevada. Key elements of this alternative included: 1) achieving "no net loss" of Greater Sage-Grouse habitat by implementation of a strategy to avoid, minimize, and mitigate impacts on Greater Sage-Grouse ; 2) Establishing the Conservation Credit System; and 3) Establishing the Sagebrush Ecosystem Technical Team.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Alternative F	Fully Analyzed	Alternative F was also based on a citizen group-recommended alternative. This alternative emphasized improvement and protection of habitat for Greater Sage-Grouse and defined different restrictions for PHMA and GHMA. Alternative F would have limited commodity development in areas of occupied Greater Sage-Grouse habitat and would have closed or designated portions of the planning area to some land uses.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Close All or Portions of PHMA or GHMA to Off-Highway Vehicle Use	Considered; Not Analyzed in Detail	Through this LUPA/EIS, the BLM has identified, but has not studied in detail, an alternative to designate new area closures for OHV use within PHMA and GHMA. The BLM has analyzed alternatives to designate all areas within PHMAs and GHMAs as "limited" to existing roads and trails for OHV use, if not already closed by existing planning efforts. Subsequent Travel Management Plans will be developed to identify specific routes within limited areas that will be closed in order to protect and conserve Greater Sage-Grouse and its habitat. The BLM and Forest Service have analyzed existing OHV area closures within PHMAs and GHMAs as part of the No Action alternative and as a decision common to all alternatives.

Nevada and Northeastern California Planning Document	Document Date	Alternative Title	Analysis Level	Alternative Description
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Elko County Sage-Grouse Plan	Considered; Not Analyzed in Detail	Elko County, Nevada developed an approach for conserving Greater Sage-Grouse s (Elko County 2012). The plan emphasized the need to maintain the multi-use concept and to avoid further restrictive federal polices to conserve Greater Sage-Grouse s. The Elko Plan identified a suite of action items by program areas to resolve current issues associated with the conservation of the Greater Sage-Grouse . The plan also identified the need for a financial incentive plan to compensate users of public lands for potential adjustments in their management. The Elko Plan was not analyzed as a separate alternative because many of the action items were already contained in either Alternatives A, D, E, or the Proposed Plan from the June 2015 planning effort. In addition, several of the action items within the Elko Plan were outside the scope of the planning effort, such as the following: 1) offering private landowners incentives when and where appropriate to achieve Greater Sage-Grouse habitat objectives; 2) discouraging and preventing additional regulations and prohibitions and limiting and preventing livestock grazing and agricultural uses on federally managed lands and private properties; 3) using Nevada Division of Forestry Conservation Camp Crews for fuels reduction projects and to support a federal grant; 4) expanding authorizations to include fire restoration projects under NEPA categorical exclusion provisions; 5) identifying funding opportunities from federal, state, local, industry, and land users dedicated to implementing prioritized habitat enhancement, restoration, and conservation.

Nevada and Northeastern California Planning Document	Document Date	Alternative Title	Analysis Level	Alternative Description
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	June 2015	Increased Grazing Alternative	Considered; Not Analyzed in Detail	During scoping and the alternatives development process, a number of individuals and cooperating agencies requested that the BLM and Forest Service consider an alternative that would increase the amount of livestock grazing in Greater Sage-Grouse habitat. This recommendation was based on empirical evidence that shows there could be a correlation between declines in Greater Sage-Grouse and declines in the amount of livestock grazing on public lands. This alternative was considered but eliminated from detailed analysis due to the fact that alternatives considered in the planning effort were science-based conservation measures that would meet the purpose and need for the project, which aimed to identify and incorporate appropriate conservation measures in LUPs to conserve, enhance, and restore Greater Sage-Grouse habitat by reducing, eliminating, or minimizing threats to that habitat. There are currently no science-based studies that demonstrate that increased livestock grazing on public lands would enhance or restore Greater Sage-Grouse habitat or maintain or increase Greater Sage-Grouse abundance and distribution.
Nevada and Northeastern California Greater Sage-Grouse Proposed LUPA/Final EIS	May 2018	No Action	Fully Analyzed	The No Action would not amend the current RMPs amended by the Nevada and Northeastern California Greater Sage-Grouse Resource Management Plan Amendment (2015 ROD/ARMPA). Greater Sage-Grouse habitat would continue to be managed under current management direction. Goals and objectives for BLM-administered lands and federal mineral estate would not change. Allowable uses and restrictions pertaining to activities such as mineral leasing and development, recreation, lands and realty, and livestock grazing would also remain the same.

Nevada and Northeastern California Planning Document	Document Date	Alternative Title	Analysis Level	Alternative Description
Nevada and Northeastern California Greater Sage-Grouse Draft Resource Management Plan Amendment and Environmental Impact Statement	May 2018	Management Alignment Alternative	Fully Analyzed	The Management Alignment Alternative made modifications to the No-Action Alternative to better align the BLM's management direction with the State of Nevada's Conservation Plan and conservation strategies with the California Department of Fish and Wildlife (CDFW) to reach a "combination of balanced and diverse resource uses," as required by FLPMA. This alternative was also developed in a collaborative process with cooperating agencies to support conservation outcomes based on state recommendations for Greater Sage-Grouse.

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2.6 Detailed Comparison of 2019 Alternatives

Table 2-2b, below, is organized by issue and provides a side-by-side comparison of the No-Action Alternative, the Draft EIS Management Alignment Alternative, and the Final EIS Proposed Plan Amendment. The Management Alignment Alternative attempts to adjust the No-Action Alternative to bring it into alignment with the Nevada and California Governors' Greater Sage-Grouse Plans, while maintaining the format and all parts of the 2015 ARMPA that were not specifically identified as issues.

Table 2-2b
Comparison of Alternatives

Topic	2015 ARMPA Decision Number	No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Issue: Modifying HMA Designations • Need for adjusting HMAs so that they reflect the best available science based on updates to habitat data and use modeling (Coates et al. 2016) and are consistent with HMAs identified by the State of Nevada and recommended by CDFW. This would provide consistency in management across jurisdictions and to third parties operating on public and state or private lands in Nevada and northeastern California. • Integration of flexibility into the plans to be able to adjust habitat management area designations (and their associated allocations), based on the best available science, through plan maintenance or amendment, as appropriate. • Maintaining all HMAs as identified in the 2015 ARMPA/ROD, including SFAs, which should be provided with the most protections.				
Update Management Areas to Incorporate Best Available Science	Appendix A, Maps	PHMA, GHMA, and OHMA boundaries are based on the 2015 Approved Resource Management Plan Amendment HMA maps (see Appendix A, Maps). These boundaries were derived from USGS' *Spatially Explicit Modeling of Greater Sage-Grouse Habitat in Nevada and Northeastern California* (Coates et al. 2014) • Manage 9,309,800 acres as PHMA ○ Including 2,797,400 acres of PHMA as SFA • Manage 5,720,700 acres as GHMA • Manage 5,876,500 acres as OHMA	PHMA, GHMA, and OHMA boundaries are based on composite management categories contained within USGS's *Spatially Explicit Modeling of Annual and Seasonal Habitat for Greater Sage-Grouse (Centrocercus urophasianus)* in Nevada and Northeastern California—an updated decision-support tool for management (Coates et al. 2016), as adopted and modified by the State of Nevada on December 11, 2015 (see Appendix A, Maps). • Manage 9,265,800 acres as PHMA • Manage 5,748,000 acres as GHMA • Manage 4,868,900 acres as OHMA BLM recognizes that landscape level mapping may not accurately reflect on-the-ground conditions. Therefore, the HMAs (**Figure 2-1b**) do not constitute a land use plan decision but rather a landscape level reference of relative habitat suitability. When a proposed project is thought to be in an area that is unsuitable for Greater Sage-Grouse within PHMA, GHMA, and/or OHMA, habitat assessments of the project site and its surrounding areas would be conducted by a qualified biologist with Greater Sage-Grouse experience using BLM-approved methods based on Stiver et al. 2015 and compliant with current BLM Policy, to identify suitable, marginal, or unsuitable Greater Sage-Grouse habitats at multiple scales. This habitat assessment process would then inform criteria (i) under *Issue: Allocation Exception Process, Management Alignment Alternative*. The BLM would track all on-the-ground assessments and would share this information with USGS and the States of Nevada and California to consider when they begin refining the habitat management maps in the future.	PHMA, GHMA, and OHMA boundaries are based on composite management categories contained within USGS's *Spatially Explicit Modeling of Annual and Seasonal Habitat for Greater Sage-Grouse (Centrocercus urophasianus)* in Nevada and Northeastern California—an updated decision-support tool for management (Coates et al. 2016), as adopted and modified by the State of Nevada on December 11, 2015 (see Appendix A: Maps**).** • Manage 9,265,800 acres as PHMA • Manage 5,748,000 acres as GHMA • Manage 4,868,900 acres as OHMA BLM recognizes that landscape level mapping may not accurately reflect on-the-ground conditions. Therefore, the HMAs (**Figure 2-1b**) do not constitute a land use plan decision but rather a landscape level reference of relative habitat suitability. When a proposed project is thought to be in an area that is unsuitable for Greater Sage-Grouse within PHMA, GHMA, and/or OHMA, habitat assessments of the project site and its surrounding areas would be conducted by a biologist with Greater Sage-Grouse experience using BLM-approved methods such as Stiver et al. 2015 and compliant with current BLM policy, to identify suitable, marginal, or unsuitable Greater Sage-Grouse habitats at multiple scales. This habitat assessment process would then inform criteria (i) under *Issue: Allocation Exception Process, Management Alignment Alternative and Proposed Plan Amendment*. The BLM would track all on-the-ground assessments and would share this information with USGS and the States of Nevada and California to consider when updating HMA maps in the future.

Topic	2015 ARMPA Decision Number	No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Habitat management area designations flexibility	MD SSS 17	As site-specific Greater Sage-Grouse data (habitat assessments, lek counts, telemetry, etc.) is collected, the information will be included into future modeling efforts using the "Spatially Explicit Modeling of Greater Sage-Grouse Habitat in Nevada and Northeastern California" (Coates et al. 2014) to reflect the most up-to-date spatial representation of Greater Sage-Grouse habitat categories. Through plan maintenance or plan amendment/revision, as appropriate, and in consultation with the Nevada Department of Wildlife and USFWS, based on the best scientific information, the updated modeling efforts may be adopted and appropriate allocation decisions and management actions will be applied to PHMA, GHMA, and OHMA. Future modeling efforts to incorporate site-specific Greater Sage-Grouse data will utilize the same modeling methods (as described under Methods and Results in Coates et al. 2014) used to develop the current Nevada and Northeastern California Subregions' Greater Sage-Grouse habitat management categories. The addition of site-specific Greater Sage-Grouse data will allow for the refinement of the spatial representation of the Greater Sage-Grouse habitat management categories.	Consistent with the State of Nevada's Greater Sage-Grouse Conservation Plan (2014, as amended) and CDFW's management recommendations, the HMA mapping process would be reviewed and refined every 3 to 5 years, or when new data are incorporated in the model. New or improved spatial data (e.g., additional Greater Sage-Grouse telemetry data, updated or improved vegetation community data) would be incorporated during the refinement process. The review and refinement process would be scientifically based and would include review and input from the Sagebrush Ecosystem Technical Team (SETT), NDOW, BLM, USFS, and USFWS. For refinements in California, this process would also include CDFW. Other stakeholders would be encouraged to participate in the process by submitting relevant information to the listed agencies. The USGS habitat suitability modeling processes (Coates et al. 2016) would be the basis for future refinements. As these habitat management categories are adjusted and approved by the States of Nevada and California, adjustments to PHMA, GHMA, and/or OHMA boundaries (along with the existing allocation decisions and management actions tied to these areas) would be made by the BLM through plan maintenance.	Consistent with the State of Nevada's Greater Sage-Grouse Conservation Plan (2014, as amended) and CDFW's management recommendations, the HMA mapping process would be reviewed and refined every 3 to 5 years, or when new data are incorporated in the model. New or improved spatial data (e.g., additional Greater Sage-Grouse telemetry data, updated or improved vegetation community data) would be incorporated during the refinement process. The review and refinement process would be scientifically based and would include review and input from the Sagebrush Ecosystem Technical Team (SETT), NDOW, BLM, USFS, USFWS, and local agencies as appropriate. For refinements in California, this process would also include CDFW. Other stakeholders would be encouraged to participate in the process by submitting relevant information to the listed agencies. The USGS habitat suitability modeling processes (Coates et al. 2016) would be the basis for future refinements, which may include results of BLM habitat suitability determinations shared with USGS for their consideration. As these habitat management categories are adjusted and approved by the States of Nevada[3] and California, adjustments to BLM's PHMA, GHMA, and/or OHMA boundaries (along with the existing allocation decisions and management actions tied to these areas) would be made by the BLM through plan maintenance or amendment, as appropriate.
Issue: Removing Sagebrush Focal Area Designations • Address cancellation of the proposed SFA withdrawal and the reasons for its cancellation. ○ Analyze the inclusion and removal of SFAs, in response to the March 31, 2017, United States District Court for the District of Nevada court order. • Is this habitat designation needed to adequately maintain conservation of Greater Sage-Grouse habitat?				
SFA	MD SSS 5 Objective Veg 1 MD Fire 2 Objective Fire 2-4 MD Fire 11-12 MD LG 2 MD LG 3 MD LG 4 MD LG 11 MD WHB 3 through 7 MD MR 3 MD MR 4a MD MR 16 MD LR 24 MD MIT 2	Designate 2,797,400 acres as SFA. SFA will be managed as PHMA, with the following additional management: • Recommended for withdrawal from the General Mining Act of 1872, subject to valid existing rights • Managed as NSO, without waiver, exception, or modification, for fluid mineral leasing • Prioritized for vegetation management and conservation actions in these areas, including, but not limited to land health assessments, wild horse and burro management actions, review of livestock grazing permits/leases, and habitat restoration.	No similar action (no areas would be managed as SFA). Lands previously identified as SFA would be managed according to their underlying habitat management area designation (PHMA, GHMA, or OHMA, as identified under this alternative).	Same as Management Alignment Alternative.

[3]The State of Nevada's Greater Sage-Grouse Conservation Plan (2014, as amended) refers to Greater Sage-grouse Management Areas (SGMA) as the spatial extent of Greater Sage-Grouse management in Nevada. For the State of Nevada, the purpose of the SGMA is to initiate consultation with the SETT in regards to the use of the State's Conservation Credit System. The BLM's HMAs are not equivalent to the SGMAs, but rather, are equivalent to the State of Nevada's "Management Categories," which are displayed on Figure 4 of the State Plan. For the State of Nevada, the approval of new iterations of their management categories are approved through the State's Sagebrush Ecosystem Council (SEC). SEC meetings are open to the public and are subject to the State of Nevada's open meeting laws. It is also important to note that the BLM's HMAs are not equivalent to identified biologically significant units (BSUs), as BSUs are one of three scales used to assess adaptive management population triggers. For more information regarding BSUs, see **Appendix D**.

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Issue: Adaptive Management • Ensure federal, state, and local partners are part of the causal factor analysis process. • Lack of flexibility with implementing and removing hard trigger adaptive management responses. • Better alignment with Department of Interior guidance on implementation of the Adaptive Management Process. • Incorporate best available science including local data and information into the adaptive management strategy. • Utilize collaborative processes with stakeholders, appropriate state and local agencies, and authorized land users when developing and implementing management responses to any trigger met or surpassed.				
Adaptive Management	MD SSS 18 MD SSS 19 MD SSS 20 MD SSS 21 MD SSS 24 Appendix G	A biologically significant unit (see **Appendix A, Figure 2-2**) that has hit a soft trigger due to vegetation disturbance will be a priority for restoration treatments consistent with Fire and Invasives Assessment Tool (FIAT) (**Appendix G**). If a soft trigger is reached, the BLM will identify the causal factor and apply additional project-level adaptive management and/or mitigation measures contained in the authorization (and for future similar authorizations), to alleviate the specific or presumptive causes in the decline of Greater Sage-Grouse populations or its habitats and include the following: The adjustment in management would be based on the causal factor and would affect only the area being impacted in the lek cluster or other appropriate scale (e.g., BSU) • Greater Sage-Grouse populations and habitat would continue to be monitored annually. • If the causal factor were not readily discernable, then an interdisciplinary team, including the BLM, Forest Service (as applicable), and state wildlife agency representatives, would identify the appropriate mitigation or adjusted management actions in a timely manner. Once a hard trigger has been reached, all responses in Tables J-1 and J-2 in Appendix J will be implemented. This includes where soft triggers have been reached for both population and habitat. When a hard trigger is hit in a Priority Area for Conservation (PAC) that has multiple BSUs, including those that cross state lines, the WAFWA Management Zone Greater Sage-Grouse Conservation Team will convene to determine the cause, will put project level responses in place, as appropriate, and will discuss further appropriate actions to be applied. The team will also investigate the status of the hard triggers in other BSUs in the PAC and will invoke the appropriate plan response. Adopting any further actions at the plan level may require initiating a plan amendment process. The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.	The revised soft and hard population triggers (signals) and new BSU and lek cluster boundaries were derived from USGS's *Hierarchical Population Monitoring of Greater Sage-Grouse (*Centrocercus urophasianus*) in Nevada and California— Identifying Populations for Management at the Appropriate Spatial Scale: U.S. Geological Survey Open-File Report 2017–1089.* These triggers (signals), BSU boundaries, and lek cluster boundaries can be found in **Appendix F**. The State of Nevada is currently in the process of incorporating the adaptive management strategy within the State of Nevada's Conservation Plan. BLM would consider alignment with the State's strategy when it is completed. Implement the Adaptive Management Strategy (**Appendix F**). Soft and hard trigger responses would be removed when the criteria for recovery have been met (see **Appendix F**, **Longevity of Responses**). Removal of the soft and hard trigger responses returns management direction in the affected lek cluster and/or BSU to the management directions that are in force within those lek clusters and/or BSUs that have not tripped a trigger.	The BLM would implement the Adaptive Management Strategy as described in **Appendix F**. The revised soft and hard population triggers, warnings, and new BSU and lek cluster boundaries were derived from USGS's *Hierarchical Population Monitoring of Greater Sage-Grouse (*Centrocercus urophasianus*) in Nevada and California— Identifying Populations for Management at the Appropriate Spatial Scale: U.S. Geological Survey Open-File Report 2017–1089* (Coates et al. 2017). These triggers, warnings, BSU boundaries, and lek cluster boundaries can be found in **Appendix F**. Soft and hard trigger responses would be removed when the criteria for recovery have been met (see **Appendix F**, **Longevity of Responses**). Removal of the soft and hard trigger responses returns management direction in the affected lek cluster and/or BSU to the management directions that were in place prior to reaching a trigger.

Topic	2015 ARMPA Decision Number	No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Issue: Mitigation • Alignment with the State of Nevada's mitigation strategy to the extent allowable by federal law on Nevada BLM-administered lands only • Defer to the State of Nevada's mitigation strategy to the extent allowable by federal law and regulation on Nevada BLM-administered lands only • Consider and analyze the State of Nevada's and California's recommendation for project level mitigation in relevant NEPA documentation • Ensure consistency in tracking and reporting changes to Greater Sage-Grouse habitat quality and quantity • Alignment with updated BLM policy regarding compensatory mitigation (IM 2018-093)				
Mitigation	MD MIT 1 MD MIT 2 Appendix F [of the 2015 ARMPA] Appendix N [of the 2015 ARMPA]	In PHMA, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) will result in an overall net conservation gain to Greater Sage-Grouse (see Appendix F [of the 2015 ARMPA]). In GHMA, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) in GHMA will result in an overall net conservation gain to Greater Sage-Grouse (see Appendix F, Regional Mitigation Strategy [of the 2015 ARMPA]). In Nevada only, the BLM will consult with the SETT for application of the "avoid, minimize, and compensate" mitigation strategy and the Conservation Credit System developed by the Nevada Department of Conservation and Natural Resources (2014a, 2014b) or other applicable mitigation system such as outlined in Appendix I [of the 2015 ARMPA]. This will be to ensure that a net conservation gain of Greater Sage-Grouse habitat is achieved in mitigating human disturbances in PHMA and GHMA (see Appendix F [of the 2015 ARMPA]) on all agency-authorized activities. The specifics of the coordination will be identified in a Memorandum of Understanding between the agencies. Subject to valid existing rights and applicable law, authorize locatable mineral development activity, by approving plans of operation and apply mitigation and best management practices that minimize the loss of PHMA and GHMA or that enhance Greater Sage-Grouse habitat by applying the "avoid, minimize and compensatory mitigation" process through an applicable mitigation system, such as the Nevada Conservation Credit System and the Barrick Nevada Sage-Grouse Bank Enabling Agreement (March 2015). In Nevada, coordinate with the SETT on the application of a compensatory mitigation program, such as the Nevada Conservation Credit System (Appendix N [of the 2015	Same as the No-Action Alternative, except Appendix F, Mitigation Strategy [of the 2015 ARMPA], would be updated to include the following clarifying language and concepts: When authorizing third-party actions, the BLM would apply the mitigation hierarchy as described in the CEQ regulations at 40 CFR 1508.20 and in the State of Nevada's Greater Sage-Grouse Conservation Plan, Section 3.1.2 (2014), which is to "avoid, minimize, and compensate," for impacts on Greater Sage-Grouse and its habitat. BLM would consult with the SETT and other state agencies when implementing the avoid, minimize, and mitigate process. The State of Nevada adopted a mitigation standard of net benefit (net conservation gain). Consistent with the State approach, this standard would be retained in the Management Alignment Alternative. In Nevada only, when authorizing third-party actions that would result in direct, indirect, or cumulative impacts on Greater Sage-Grouse or their habitat, the BLM would require those impacts to be quantified using the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes to habitat quality and quantity. When adverse impacts on Greater Sage-Grouse and its habitat remain after avoidance and minimization, mitigation would be considered subject to the federal regulations governing the authorization and valid existing rights. When it is determined that an activity requires compensatory mitigation, or a proponent voluntarily offers to conduct compensatory mitigation, the BLM would coordinate with the SETT regarding use of the Conservation Credit System and/or evaluation of other proponent-developed mitigation options. Evaluation of mitigation options would be assessed using the HQT to ensure net benefit (net conservation gain) and that impacts calculated using the HQT would be mitigated with the equivalent number of functional acres regardless of mitigation method.	Revised to align with current BLM policy and guidance regarding mitigation issued on July 24, 2018 through IM 2018-093. • When authorizing third-party actions in designated Greater Sage-Grouse habitat, the BLM will seek to achieve the planning-level Greater Sage-Grouse management goals and objectives through implementation of mitigation and management actions, consistent with valid existing rights and applicable law. Under this Proposed Plan Amendment, management would be consistent with the Greater Sage-Grouse goals and objectives, and in conformance with BLM Manual 6840, Special Status Species Management. In accordance with BLM Manual 6840, the BLM will undertake planning decisions, actions and authorizations "to minimize or eliminate threats affecting the status of [Greater Sage-Grouse] or to improve the condition of [Greater Sage-Grouse] habitat" across the planning area. • The BLM has determined that compensatory mitigation must be voluntary unless required by other applicable law and in recognition that state authorities may also require compensatory mitigation (IM 2018-093, *Compensatory Mitigation*, July 24, 2018). Therefore, consistent with valid existing rights and applicable law, when authorizing third-party actions that result in habitat loss and degradation, the BLM would consider voluntary compensatory mitigation actions only as a component of compliance with a state mitigation plan, program, or authority, or when offered voluntarily by a project proponent. • In all Greater Sage-Grouse habitat, before authorizing third-party actions that result in habitat loss and degradation within the State of Nevada, the BLM will complete the following steps, in alignment with the State of Nevada's Greater Sage-Grouse Conservation Plan (2014, as amended), including avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions: 1. Notify the State of Nevada's Sagebrush Ecosystem Technical Team to determine if the State requires or recommends any additional mitigation – including compensatory mitigation – under State regulations, policies, or programs related to the conservation of Greater Sage-Grouse. 2. Incorporate state required or recommended mitigation into the BLM's NEPA decision-making process, if the State of Nevada's Sagebrush Ecosystem Technical determines that there are unacceptable residual impacts on Greater Sage-Grouse or its habitat and compensatory mitigation is required as a part of State policy or authorization, or if a proponent voluntarily offers mitigation.

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		ARMPA]) for mitigating activities that result in habitat loss and degradation of Greater Sage-Grouse habitat in Nevada, where the application of compensatory mitigation will occur on or the credit will be applied to disturbance on BLM-administered lands. Identify compensatory mitigation areas in PHMA and GHMA with the potential to achieve Greater Sage-Grouse habitat objectives (Habitat Objectives table in the 2015 Final EIS), in accordance with FIAT, the SFA prioritization, and the State of Nevada Strategic Action Plan.		3. Analyze whether the compensatory mitigation: o achieves measurable outcomes for Greater Sage-Grouse habitat function that are at least equal to the lost or degraded values o provides benefits that are in place for at least the duration of the impacts o accounts for a level of risk that the mitigation action may fail or not persist for the full duration of the impact 4. Verify that the project proponent has coordinated with the State of Nevada's Sagebrush Ecosystem Technical Team to ensure it complies with the State of Nevada's Greater Sage-Grouse Conservation Plan (2014, as amended) and all applicable State requirements relating to it's proposal • Project-specific analysis will be necessary to determine how a compensatory mitigation proposal addresses impacts from a proposed action. The BLM will cooperate with the State to determine appropriate project design and alignment with State policies and requirements, including those regarding compensatory mitigation. When the BLM is considering compensatory mitigation as a component of the project proponent's submission or based on a requirement of or recommendation from the State, the BLM's NEPA analysis would evaluate the need to avoid or minimize impacts of the proposed project and achieve the goals and objectives of this RMPA. The BLM will defer to the appropriate State authority to quantify habitat offsets, durability, and other aspects used to determine the recommended compensatory mitigation action. • The BLM would not deny a proposed authorization in Greater Sage-Grouse habitat solely on the grounds that the proponent has not proposed or agreed to undertake voluntary compensatory mitigation. • The BLM would continue to apply the mitigation hierarchy as described in the CEQ Regulations at 40 CFR 1508.20; however, the BLM would focus on avoiding, minimizing, rectifying or reducing impacts over time. Compensation, which involves replacing or providing substitute resources for the impacts (including payment) would only be considered when voluntarily offered by a proponent, in coordination with the States of Nevada and California. • Appendix F has been removed from the Proposed Plan Amendment. The BLM would ensure project design is aligned with State requirements—including compensatory mitigation—that may be necessary to comply with State policies and programs for the conservation of Greater Sage-Grouse. When the BLM is considering compensatory mitigation as a component of the project proponent's submission or based on a recommendation from the States, the BLM's NEPA analysis would evaluate the need for resolving or eliminating impacts of the proposed project and achieving the goals and objectives of this RMPA. Additional project-specific analysis would be necessary to determine how the compensatory mitigation proposal supports BLM's obligation to evaluate and appropriately implement mitigation to address impacts from a

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				project proposal. • On BLM-administered lands within Nevada and California, when authorizing third-party actions that would result in direct, indirect, or cumulative impacts on Greater Sage-Grouse or their habitat, the BLM would defer to the State of Nevada's most current version of the Habitat Quantification Tool (HQT) to quantify those impacts to ensure consistency in tracking/reporting changes to Greater Sage-Grouse habitat quality and quantity.
Issue: Allocation Exception Process • Clarify and make consistent the various exception allocation processes. • Verify through ground-truthing (Greater Sage-Grouse habitat suitability assessments, such as Stiver et al. 2015), the use of landscape-scale mapping of PHMA, GHMA, and OHMA in regards to the application of allocations and stipulations. • Address restrictions on actions related to public health and safety, existing infrastructure, and administrative functions that serve a public purpose. • Address inconsistencies with existing federal legislation and Approved Resource Management Plans that include land tenure adjustments, including, but not limited to: disposals, exchanges, transfers and Recreation and Public Purpose actions.				
Allocation Exception Process	MD MR 4a MD MR 3 MD MR 21 MD RE 4 MD LR 21 MD REC 3 Appendix G [of the 2015 ARMPA]	(Geothermal) For BLM land in the State of Nevada only, in the portions of the PHMA outside of SFA, geothermal projects may be considered for authorization if all of the following conditions are met: • A team comprised of BLM, USFWS, and NDOW specialists advises the BLM State Director on appropriate mitigation measures for the project and its ancillary facilities, including lek buffer distances using the best available science; • Mitigation actions are consistent with this Plan's mitigation strategy such as the Nevada Conservation Credit System, and • The footprint of the project is consistent with the disturbance management protocols identified in this plan (see MD SSS 2 and Appendix E [of the 2015 ARMPA]) (Salable Minerals) PHMA are closed to new mineral material sales (see **Appendix A**, **Figure 2-6**). However, these areas remain open to free use permits and the expansion of existing active pits, if requirements in MD MR 20 can be met [Objective SSS 4 and apply MDs SSS 1 through SSS 4]. (Oil and Gas) In PHMA outside of SFA, no waivers or modifications to an oil and gas lease no-surface-occupancy stipulation will be granted. In PHMA, the Authorized Officer may grant an exception to an oil and gas lease no-surface-occupancy stipulation only where the proposed action: i. Will not have direct, indirect, or cumulative effects on Greater Sage-Grouse or its habitat; or, ii. Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to Greater Sage-Grouse. Exceptions based on conservation gain (ii) may only be considered in (a) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) Areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby	In PHMA and GHMA, the State Director may grant an exception to the land use plan allocations and stipulations described in Section 2-5 if one of the following applies (in coordination with NDOW, SETT, and/or CDFW): i. The location of the proposed authorization is determined to be unsuitable (by a qualified biologist with Greater Sage-Grouse experience using methods based on Stiver et al 2015); lacks the ecological potential to become marginal or suitable habitat; and would not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat. Management allocation decisions would not apply to those areas determined to be unsuitable because the area lacks the ecological potential to become marginal or suitable habitat; ii. Impacts from the proposed action could be offset through use of the mitigation hierarchy (avoid, minimize, mitigate) to achieve a net conservation gain and demonstrate that the individual and cumulative impacts of the project would not result in habitat fragmentation or other impacts that would cause Greater Sage-Grouse populations to decline. iii. The proposed action would be authorized to address public health and safety concerns, specifically as they relate to local, state, and national priorities. iv. Renewals or re-authorizations of existing infrastructure in previously disturbed sites or expansions of existing infrastructure that have *de minimis* impacts or do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat. v. The proposed action would be determined a routine administrative function conducted by State or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e. rights-of-way for roads) that serve such a public purpose. vi. Exceptions to lands that are identified for retention in **Figure 2-12b** would be considered for disposal or exchange if they were identified for disposal through previous planning efforts, either as part of the due process of carrying out Congressional Acts (e.g., the respective Lincoln and White Pine County Conservation,	In PHMA, GHMA, and OHMA, the State Director may grant an exception to the allocations and stipulations described in **Table 2-1**: Comparative Summary of Alternatives if one of the following applies (in coordination with NDOW, SETT, and/or CDFW): i. The location of the proposed activity is determined to be unsuitable (by a biologist with Greater Sage-Grouse experience using methods such as Stiver et. al. 2015); lacks the ecological potential to become marginal or suitable habitat; and would not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat. Management allocation decisions would not apply to those areas determined to be unsuitable because the area lacks the ecological potential to become marginal or suitable habitat; ii. The proposed activity's impacts could be offset to result in no adverse impacts on Greater Sage-Grouse or its habitat, through use of the mitigation hierarchy consistent with Federal law and the state's mitigation policies and programs. In cases where exceptions may be granted for projects with a residual impact, voluntary compensatory mitigation consistent with the State's management goals could be one mechanism by which a proponent achieves the RMPA goals, objectives, and exception criteria. When a proponent volunteer's compensatory mitigation as their chosen approach to address residual impacts, the BLM can incorporate those actions into the rationale used to grant an exception. The final decision to grant a waiver, exception, or modification would be based, in part, on criteria consistent with the state's Greater Sage-Grouse management plans and policies. iii. The proposed activity would be authorized to address public health and safety concerns, specifically as they relate to federal, state, local government and national priorities. iv. Renewals or re-authorizations of existing infrastructure in previously disturbed sites or expansions of existing infrastructure that do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat. v. The proposed activity would be determined a routine administrative function conducted by federal, state or local

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		parcel subject to a valid federal oil and gas lease existing as of the date of this RMP amendment. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts (see **Appendix G** [of the 2015 ARMPA]). Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other Greater Sage-Grouse expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publicly available at least quarterly. (Wind Energy) Within PHMA, wind facilities associated with existing industrial infrastructure (e.g., a mine site) to provide on-site power generation could be considered for approval, subject to a net conservation gain. (Land Tenure) Lands classified as PHMA and GHMA for Greater Sage-Grouse will be retained in federal management, unless: (1) the agency can demonstrate that disposal of the lands, including land exchanges, will provide a net conservation gain to Greater Sage-Grouse or (2) the agency can demonstrate that the disposal, including land exchanges, of the lands will have no direct or indirect adverse impact on conservation of the Greater Sage-Grouse (see **Appendix A**, **Figure 2-12**). (Recreation) In PHMA, do not construct new recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) unless the development will have a net conservation gain to Greater Sage-Grouse and its habitat (such as concentrating recreation, diverting use away from critical areas, etc.), or unless the development is required for visitor health and safety or resource protection.	Recreation, and Development Acts) and the agency can demonstrate that the disposal, including land exchanges, would have no direct or indirect adverse impact on conservation of the Greater Sage-Grouse or can achieve a net conservation gain through the use of compensatory mitigation.	governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e., rights-of-way for roads) that serve a public purpose and would have no adverse impacts on Greater Sage-Grouse and its habitat, consistent with the state's mitigation policies and programs. vi. Exceptions to lands that are identified for retention in **Figure 2-12b** would be considered for disposal or exchange if they were identified for disposal through previous planning efforts, either as part of the due process of carrying out Congressional Acts (e.g., the respective Lincoln and White Pine County Conservation, Recreation, and Development Acts) or the agency can demonstrate that the disposal, including land exchanges, would have no direct, indirect or cumulative impacts on Greater Sage-Grouse and its habitat.

Topic	2015 ARMPA Decision Number	No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
Issue: Seasonal Timing Restrictions • Alignment with State of Nevada's conservation plan and management strategies with the State of California, to the greatest extent possible • Consider exceptions and/or modifications to seasonal timing restrictions to allow for beneficial or neutral projects to occur in a timely manner • Seasonal timing restrictions need to be adjusted to allow for public health and safety concerns and time sensitive administrative functions that serve a public purpose to be addressed without delay				
Seasonal Timing Restrictions	MD SSS 2E MD SSS 3D Appendix G [of the 2015 ARMPA]	Seasonal restrictions will be applied during the periods specified below to manage discretionary surface-disturbing activities and uses on public lands (i.e., anthropogenic disturbances) that are disruptive to Greater Sage-Grouse, to prevent disturbances to Greater Sage-Grouse during seasonal life-cycle periods. 1. In breeding habitat within 4 miles of active and pending Greater Sage-Grouse leks from March 1 through June 30: a. Lek—March 1 to May 15 b. Lek hourly restrictions—6 p.m. to 9 a.m. c. Nesting—April 1 to June 30 2. Brood-rearing habitat from May 15 to September 15 a. Early—May 15 to June 15 b. Late—June 15 to September 15 3. Winter habitat from November 1 to February 28 The seasonal dates may be modified due to documented local variations (e.g., higher/lower elevations) or annual climatic fluctuations (e.g., early/late spring, long/heavy winter), in coordination with NDOW and California Department of Fish and Wildlife (CDFW), in order to better protect Greater Sage-Grouse and its habitat. Footnote: The conditions would not be applicable to vegetation treatments being conducted to enhance Greater Sage-Grouse habitat, with exceptions for seasonal restrictions and noise.	Same as the No-Action Alternative, except: The seasonal dates could be modified or waived (in coordination with NDOW and/or CDFW) based on site-specific information that indicates: i. A project proposal's NEPA document and/or project record, and correspondence from NDOW and/or CDFW, demonstrates that any modification (shortening/extending seasonal timeframes or waiving the seasonal timing restrictions all together) is justified on the basis that it serves to better protect or enhance Greater Sage-Grouse and its habitat than if the strict application of seasonal timing restrictions are implemented. Under this scenario modification can occur if: a) A proposed authorization would have beneficial or neutral impacts on Greater Sage-Grouse. b) There are documented local variations (e.g., higher/lower elevations) and/or annual climatic fluctuations (e.g., early/late spring, long/heavy winter) that indicate the seasonal life cycle periods are different than presented, or that Greater Sage-Grouse are not using the area during a given seasonal life cycle period. ii. Modifications are needed to address an immediate public health and safety concern in a timely manner (e.g. maintaining a road impacted by flooding).	Same as the No-Action Alternative, except: The seasonal dates could be modified or waived (in coordination with NDOW and/or CDFW) based on site-specific information that indicates: i. A project proposal's NEPA document and/or project record, and correspondence from NDOW and/or CDFW, demonstrates that any modification (shortening/extending seasonal timeframes or waiving the seasonal timing restrictions all together) is justified on the basis that it serves to better protect or enhance Greater Sage-Grouse and its habitat than if the seasonal timing restrictions are implemented. Under this scenario modification can occur if: a) A proposed activity would have beneficial or neutral impacts on Greater Sage-Grouse. b) Topography or other factors eliminate direct and indirect impacts from visibility and audibility to Greater Sage-Grouse and its habitat. c) There are documented local variations (e.g., higher/lower elevations) and/or annual climatic fluctuations (e.g., early/late spring, long/heavy winter) that indicate the seasonal life cycle periods are different than presented, or that Greater Sage-Grouse are not using the area during a given seasonal life cycle period. ii. Modifications are needed to address an immediate public health and safety concern in a timely manner (e.g., maintaining a road impacted by flooding). iii. The proposed action would be determined a routine administrative function conducted by federal, state or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e., rights-of-way for roads) that serve a public purpose and would have no adverse impacts on Greater Sage-Grouse or its habitat.

Topic	2015 ARMPA Decision Number	No-Action Alternative	Management Alignment Alternative	Proposed Plan Amendment
ISSUE: Modifying Habitat Objectives • Consideration of site potential based on Ecological Site Descriptions, State and Transition Models, etc. • Consistency with State of Nevada's Desired Habitat Conditions • Incorporation of best available current science supporting modifications. • Clarify that Habitat Objectives are actually desired outcomes expressed as goals consistent with BLM Planning Handbook (H-1601-1).				
Modifying Habitat Objectives	No similar action.	No similar action.	The Habitat Objectives table in the 2015 Final EIS would be revised to incorporate best available science in coordination with representatives from the SETT, USFWS, NDOW, CDFW, USFS, USGS, and BLM. The team would review and incorporate the best available science and would recommend adjustments based on regionally and locally derived data. As these habitat objectives are updated, adjustments would be made by the BLM through plan maintenance. The Habitat Objectives table in the 2015 Final EIS would be implemented following this guidance: The Habitat Objectives table in the 2015 Final EIS are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Objectives should be based on sources such as ecological site descriptions, associated state-and-transition models.	The Habitat Objectives table in the 2015 Final EIS would be revised to incorporate best available science in coordination with the SETT, USFWS, NDOW, CDFW, USFS, USGS, University of Nevada, Reno, University of California, and appropriate local agencies, and BLM. The team would review and incorporate the best available science and would recommend adjustments based on locally derived data. As the Habitat Objectives (Table 2-2 of the 2015 Final EIS) are updated, adjustments would be made by the BLM through plan maintenance or amendment, as appropriate. The Habitat Objectives (Table 2-2) in the 2015 Final EIS would be implemented following this guidance: The Habitat Objectives (Table 2-2) in the 2015 Final EIS are desired habitat conditions that are broad goals based on Greater Sage-Grouse habitat selection that may not be achievable in all areas. The ability of a site to achieve the objectives should be based on site potential, ecological site descriptions, state-and-transition models, etc.

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Table 2-2c. Alternatives analyzed in detail during the 2015 planning effort and incorporated into the 2019 process. **Table 2-2c** is in two parts. Part I are the LUP Description of Alternative Goals and Objectives analyzed in 2015 and Part II are the Management Actions analyzed in 2015.

Part I Goals and Objectives

Table 2-2c (Part 1)
Description of Alternative Goals and Objectives

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Special Status Species (Greater Sage-Grouse)						
Goal A-SSS 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS 1: Maintain and/or increase Greater Sage-Grouse abundance and distribution by conserving, enhancing or restoring the sagebrush ecosystem upon which populations depend in cooperation with other conservation partners.	Goal C-SSS 1: Same as Alternative A.	Goal D-SSS 1: Maintain and/or increase abundance and distribution of Greater Sage-Grouse on BLM-administered and National Forest System lands by conserving, enhancing, or restoring the sagebrush ecosystem upon which populations depend, in cooperation with other conservation partners. Manage activities and authorizations on public lands to reduce predation of Greater Sage-Grouse on public lands.	Goal E-SSS 1: The State's goal for the conservation of Greater Sage-Grouse in the State of Nevada is to provide for long-term conservation by protecting the sagebrush ecosystem upon which the species depends. Redundant, representative, and resilient populations of Greater Sage-Grouse will be maintained through amelioration of threats; enhancement and protection of key habitats; mitigation for loss of habitat due to anthropogenic disturbances; and restoration or rehabilitation of habitat degraded or lost due to Acts of Nature.	Goal F-SSS 1: Maintain and increase current Greater Sage-Grouse abundance and distribution by conserving, enhancing or restoring the sagebrush ecosystem.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Goal A-SSS 2: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS 2: —[1]	Goal C-SSS 2: —	Goal D-SSS 2: Manage activities and authorizations on public lands to reduce predation of Greater Sage-Grouse on public lands.	Goal E-SSS 2: TMA-9: Implement a predator control program to reduce transient raven populations for nest protection and increased chick survival throughout the interim period while habitat enhancement and restoration projects become established. Greater Sage-Grouse population, nest success, and recruitment goals should be established for the SGMA (State of Nevada 2014). Focus on a six-point plan that is summarized here and expanded below. 1. Control access to garbage dumps and landfills. 2. Control access to road kill. 3. Control access to abandoned animal carcasses. 4. Control access to artificial nesting and roosting structures. 5. Ensure adequate nesting cover for Greater Sage-Grouse. 6. Increase site-specific take of ravens.	Goal F-SSS 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SSS 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS 1: —	Objective C-SSS 1: —	Objective D-SSS 1: Ensure that authorizations include stipulations and design features to reduce or eliminate opportunities to attract and provide nesting, cover, or perches for predators in PHMA and GHMA.	Objective E-SSS 1: If impacts are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and developing permit conditions with measures to lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]).	Objective F-SSS 1: —	
Objective A-SSS 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS 2: —	Objective C-SSS 2: —	Objective D-SSS 2: —	Objective E-SSS 2: —	Objective F-SSS 2: Restore and maintain sagebrush steppe to its ecological potential in PHMA and GHMA.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SSS 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS 3: —	Objective C-SSS 3: —	Objective D-SSS 3: Manage land resource uses to meet Greater Sage-Grouse habitat objectives as described in Table 2-11 in section 2.8.5 of this Chapter.	Objective E-SSS 3: Maintain and manage Greater Sage-Grouse habitat across the sagebrush ecosystem in the state. The habitat objectives (see Table 2-2) will be used to evaluate management actions that are proposed in Greater Sage-Grouse habitat to ensure that habitat conditions are maintained if currently meeting objectives; or habitat conditions are making progress toward these objectives if the current conditions do not meet these objectives.	Objective F-SSS 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SSS 4: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS 4: Protect PHMA from anthropogenic disturbances that will reduce distribution or abundance of Greater Sage-Grouse .	Objective C-SSS 4: Same as Alternative A.	Objective D-SSS 4: Manage land and resource uses to conserve local Greater Sage-Grouse populations, sagebrush communities and landscapes, and protect Greater Sage-Grouse PHMA and GHMA from anthropogenic disturbances that would reduce distribution or abundance of Greater Sage-Grouse .	Objective E-SSS 4: The overarching objective of the State of Nevada's plan is to achieve a net conservation gain to Greater Sage-Grouse habitat within the SGMA in order to stop the decline of Greater Sage-Grouse populations. Net conservation gain is defined as the State's objective to maintain the current quantity and quality of Greater Sage-Grouse habitat within the SGMA at the state-wide level by protecting existing Greater Sage-Grouse habitat or by mitigating for loss due to anthropogenic disturbances. Mitigation requirements are determined by the Conservation Credit System. This objective will be measured by the credit to debit ratio.	Objective F-SSS 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Sub-Objective A-SSS 1: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B-SSS 1: Designate Greater Sage-Grouse PHMA for each WAFWA management zone (Stiver et al. 2006) across the current geographic range of Greater Sage-Grouse that are large enough to stabilize populations in the short term and enhance populations over the long term.	Sub-Objective C-SSS 1: —	Sub-Objective D-SSS 1: —	Sub-Objective E-SSS 1: —	Sub-Objective F-SSS 1: —	
Sub-Objective A-SSS 2: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B-SSS 2: To maintain or increase current populations, manage or restore priority areas so that at least 70% of the land cover provides adequate sagebrush habitat to meet Greater Sage-Grouse needs.	Sub-Objective C-SSS 2: —	Sub-Objective D-SSS 2: Manage for no net unmitigated loss of PHMA and maintain or improve current habitat conditions to meet Greater Sage-Grouse life history needs.	Sub-Objective E-SSS 2: The overarching objective of the State of Nevada's plan is to achieve a net conservation gain to Greater Sage-Grouse habitat within the SGMA in order to stop the decline of Greater Sage-Grouse populations.	Sub-Objective F-SSS 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Sub-Objective A-SSS 3: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B- SSS 3: Develop quantifiable habitat and population objectives with WAFWA and other conservation partners at the management zone and/or other appropriate scales. Develop a monitoring and adaptive management strategy to track whether these objectives are being met, and allow for revisions to management approaches if they are not.	Sub-Objective C-SSS 3: —	Sub-Objective D-SSS 3: —	Sub-Objective E-SSS 3: —	Sub-Objective F-SSS 3: —	
Sub-Objective A-SSS 4: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B-SSS 4: Manage Greater Sage-Grouse PHMA so that discrete anthropogenic disturbances cover less than 3% of the total Greater Sage-Grouse habitat regardless of ownership. Anthropogenic features include but are not limited to paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills,	Sub-Objective C-SSS 4: —	Sub-Objective D-SSS 4: Implement program specific management actions to eliminate or minimize anthropogenic disturbances that threaten Greater Sage-Grouse and its habitat.	Sub-Objective E-SSS 4: The State of Nevada's overriding policy for all management actions within the SGMA is to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat. This is a fundamental hierarchical decision process that seeks to: Avoid – Eliminate conflicts by relocating disturbance activities outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse	Sub-Objective F-SSS 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	homes, and mines. • In PHMA where the 3% disturbance cap is already exceeded from any source, no further anthropogenic disturbances will be permitted by BLM or Forest Service until enough habitat has been restored to maintain the area under this threshold (subject to valid existing rights). • In this instance, an additional objective will be designated for the priority area to prioritize and reclaim/restore anthropogenic disturbances so that 3% or less of the total PHMA is disturbed within 10 years.			habitat is the preferred option. Minimize –If impacts are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and/ or developing permit conditions to include measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features, such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation. Mitigate – If impacts are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.		
Sub-Objective A-SSS 5: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B-SSS 5: Quantify and delineate GHMA for capability to provide connectivity among priority areas (Knick and Hanser 2011).	Sub-Objective C-SSS 5: —	Sub-Objective D-SSS 5: Maintain or improve connectivity to and within PHMA to promote movement and genetic diversity for population persistence and expansion.	Sub-Objective E-SSS 5: —	Sub-Objective F-SSS 5: —	
Sub-Objective A-SSS 6: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective B-SSS 6: Conserve, enhance or restore Greater Sage-Grouse habitat and connectivity (Knick and Hanser 2011) to promote movement and genetic diversity, with emphasis on those Greater Sage-Grouse occupied habitat.	Sub-Objective C-SSS 6: —	Sub-Objective D-SSS 6: Maintain or improve connectivity to and within GHMA to promote movement and genetic diversity for population persistence and expansion.	Sub-Objective E-SSS 6: —	Sub-Objective F-SSS 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Sub-Objective A-SSS 7: No common sub-objective across LUPs within the sub-region. See Section 2.10.1.	Sub-Objective SSS 7: Assess GHMA to determine potential to replace lost PHMA caused by perturbations and/or disturbances and provide connectivity (Knick and Hanser 2011) between priority areas. • These habitats should be given some priority over other GHMA that provide marginal or substandard Greater Sage-Grouse habitat. • Restore historical habitat functionality to support Greater Sage-Grouse populations guided by objectives to maintain or enhance connectivity. Total area and locations will be determined at the LUP level. • Enhance GHMA such that population declines in one area are replaced elsewhere within the habitat.	Sub-Objective C-SSS 7: —	Sub-Objective D-SSS 7: —	Sub-Objective E-SSS 7: —	Sub-Objective F-SSS 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Adaptive management						
Goal A-SSS-AM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS-AM 1: —	Goal C-SSS-AM 1: —	Goal D-SSS-AM 1: Ensure additional PHMA and GHMA is identified based upon new science, monitoring of PHMA and GHMA.	Goal E-SSS-AM 1: The Nevada Sagebrush Ecosystem Council, through field verifications and recommendations from the Nevada Sagebrush Ecosystem Technical Team based on the best available science, will further refine the area identified as suitable habitat. The Council will also refine the management categories within the SGMA.	Goal F-SSS-AM 1: —	
Goal A-SSS-AM 2: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B- SSS-AM 2: —	Goal C-SSS-AM 2: —	Goal D-SSS-AM 2: Promote a collaborative and integrated approach to Greater Sage-Grouse conservation among federal, tribal, state, and county agencies, as well as private landowners and organizations, permit holders and other public land users.	Goal E-SSS-AM 2: Due to the broad reach of Greater Sage-Grouse habitat, effective management and implementation of Greater Sage-Grouse conservation actions must be conducted through a collaborative, interagency approach that engages private, non-governmental, local, state, tribal, and federal stakeholders to achieve sufficient conservation of the Greater Sage-Grouse and their habitat.	Goal F-SSS-AM 2: —	
Objective A-SSS-AM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS-AM 1: —	Objective C-SSS-AM 1: —	Objective D-SSS-AM 1: In PHMA where large scale disturbance has occurred, manage adjoining GHMA as PHMA.	Objective E-SSS-AM 1: —	Objective F-SSS-AM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SSS-AM 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS-AM 2: —	Objective C-SSS-AM 2: —	Objective D-SSS-AM 2: Identify and implement additional Greater Sage-Grouse conservation actions that can augment, enhance, and/or integrate program conservation measures established in agency and state land use and policy plans.	Objective E-SSS-AM 2: —	Objective F-SSS-AM 2: —	
Disease						
Goal A-SSS-D 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS-D 1: —	Goal C-SSS-D 1: —	Goal D-SSS-D 1: Manage activities and authorizations on public lands to minimize opportunities to establish or enable disease vectors that could affect Greater Sage-Grouse populations.	Goal E-SSS-D 1: —	Goal F-SSS-D 1: —	
Objective A-SSS-D 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B- SSS-D 1: —	Objective C-SSS-D 1: —	Objective D-SSS-D 1: Monitor trends in West Nile Virus spread within the sub-region to determine if mitigation or additional RDFs need to be applied (consistent with applicable law) to use authorizations.	Objective E-SSS-D 1: —	Objective F- SSS-D 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Administrative Collaboration and decision making						
Goal A-SSS-ACDM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS-ACDM 1: —	Goal C-SSS-ACDM 1: —	Goal D-SSS-ACDM 1: —	Goal E-SSS-ACDM 1: The overarching objective of the State of Nevada's plan is to achieve a net conservation gain to Greater Sage-Grouse habitat within the SGMA in order to stop the decline of Greater Sage-Grouse populations.	Goal F-SSS-ACDM 1: —	
Objective A-SSS-ACDM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS-ACDM 1: —	Objective C-SSS-ACDM 1: —	Objective D-SSS-ACDM 1: —	Objective E-SSS-ACDM 1: The State of Nevada's overriding policy for all management actions within the SGMA is to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat.	Objective F-SSS-ACDM 1: —	
Objective A-SSS-ACDM 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS-ACDM 2: —	Objective C-SSS-ACDM 2: No similar objective.	Objective D-SSS-ACDM 2: —	Objective E-SSS-ACDM 2: —	Objective F-SSS-ACDM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Opportunities for Proactive Measures						
Goal A-SSS-OPM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SSS-OPM 1: —	Goal C-SSS-OPM 1: —	Goal D-SSS-OPM 1: Promote a collaborative and integrated approach to Greater Sage-Grouse conservation among federal, tribal, state, and county agencies, as well as private landowners and organizations, permit holders and other public land users.	Goal E-SSS-OPM 1: Due to the broad reach of Greater Sage-Grouse habitat, effective management and implementation of Greater Sage-Grouse conservation actions must be conducted through a collaborative, interagency approach that engages private, non-governmental, local, state, tribal, and federal stakeholders to achieve sufficient conservation of the Greater Sage-Grouse and their habitat.	Goal F-SSS-OPM 1: —	
Objective A-SSS-OPM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SSS-OPM 1: —	Objective C-SSS-OPM 1: —	Objective D-SSS-OPM 1: Identify and implement additional Greater Sage-Grouse conservation actions that can augment, enhance, and/or integrate program conservation measures established in agency and state land use and policy plans.	Objective E-SSS-OPM 1: —	Objective F-SSS-OPM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Habitat Restoration/Vegetation Management						
Goal A-VEG 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-VEG 1: —	Goal C-VEG 1: —	Goal D-VEG 1: Establish and maintain a resilient sagebrush vegetative community and restore sagebrush vegetation communities to reduce Greater Sage-Grouse habitat fragmentation and maintain or re-establish Greater Sage-Grouse habitat connectivity over the long-term.	Goal E-VEG 1: (Long-term Goal) Maintain an ecologically healthy and intact sagebrush ecosystem that is resistant to the invasion of non-native species and resilient after disturbances such as wildfire.	Goal F-VEG 1: —	
Goal A-VEG 2: —	Goal B-VEG 2: —	Goal C-VEG 2: —	Goal D-VEG 2: —	Goal E-VEG 2: (Long-term Goal) Restore wildfire return intervals to within a spatial and temporal range of variability that supports sustainable populations of Greater Sage-Grouse and other sagebrush obligate species.	Goal F-VEG 2: —	
Goal A-VEG 3: —	Goal B-VEG 3: —	Goal C-VEG 3: —	Goal D-VEG 3: —	Goal E-VEG 3: (Short-term Goal) Reduce the amount of Greater Sage-Grouse habitat loss due to large acreage wildfires and invasion by non-native species.	Goal F-VEG 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 1: N—	Objective C-VEG 1: —	Objective D-VEG 1: In PHMA and GHMA including riparian, manage for vegetation composition and structure consistent with ecological site potential and to achieve Greater Sage-Grouse seasonal habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Objective E-VEG 1: In Core, Priority, and General Management Areas, including riparian areas, manage for vegetation composition and structure consistent with ecological site potential and where possible to achieve Greater Sage-Grouse seasonal habitat objectives (see Table 2-2).	Objective F-VEG 1: —	
Objective A-VEG 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 2: —	Objective C-VEG 2: —	Objective D-VEG 2: Focus and prioritize habitat restoration to address identified threats at the Sub-Population and Population scale.	Objective E-VEG 2: —	Objective F-VEG 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 3: —	Objective C-VEG 3: —	Objective D-VEG 3: Focus rehabilitation efforts on re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential.	Objective E-VEG 3: Ecological site descriptions and associated state and transition models will be used to identify target areas for resiliency enhancement and restoration. Maintaining and enhancing resilience should be given top priority. In the Great Basin sagebrush-bunchgrass communities, invasion resistance and successional resilience following disturbance are functions of a healthy perennial bunchgrass component. A combination of active and passive management will be required to ensure this functionality. Areas that are in an invaded state that will likely transition to an annual grass monoculture if a disturbance occurs and are located within or near Greater Sage-Grouse habitat should be prioritized for restoration efforts to increase resistance and resilience.	Objective F-VEG 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG 4: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 4: —	Objective C-VEG 4: —	Objective D-VEG 4: Restore native (or desirable) plants and create landscape patterns (e.g., seral stage and spatial distribution) which most benefit Greater Sage-Grouse .	Objective E-VEG 4: —	Objective F-VEG 4: —	
Objective A-VEG 5: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 5: —	Objective C-VEG 5: —	Objective D-VEG 5: Within PHMA and GHMA manage lotic and lentic riparian areas to maintain a component of perennial forbs with diverse species richness and maintain suitable cover; manage associated upland habitat to promote adjacent cover relative to site potential to facilitate brood rearing (See Table 2-11 in section 2.8.5 of this Chapter).	Objective D-VEG 5: Within Core, Priority, and General Management Areas, manage lotic and lentic riparian areas to maintain a component of perennial forbs with diverse species richness and maintain suitable cover. Manage associated upland habitat to promote adjacent cover relative to site potential to facilitate brood rearing (See Table 2-2).	Objective F-VEG 5: —	
Objective A-VEG 6: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG 6: —	Objective C-VEG 6: —	Objective D-VEG 6: Manage lentic riparian (i.e. seeps, springs, and wet meadows) to meet Greater Sage-Grouse cover and food objectives in PHMA and GHMA.	Objective D-VEG 6: Manage lentic riparian (e.g. seeps, springs, and wet meadows) to meet or be trending toward Greater Sage-Grouse cover and food objectives (see Table 2-2) in Core, Priority, and General Management Areas.	Objective F-VEG 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Integrated Invasive Species Management						
Objective V A-EG-ISM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG-ISM 1: —	Objective C-VEG-ISM 1: —	Objective D-VEG-ISM 1: —	Objective E-VEG-ISM 1: Restore ecologically functioning sagebrush ecosystems in Greater Sage-Grouse habitat already compromised by invasion. Restoration may include revegetating sites with native plants cultivated locally or locally adapted, non-native plant species where appropriate.	Objective F-VEG-ISM 1: Develop and implement methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants.	
Objective A-VEG-ISM 2: —	Objective B-VEG-ISM 2: —	Objective C-VEG-ISM 2: —	Objective D-VEG-ISM 2: —	Objective E-VEG-ISM 2: Prevent the establishment of invasive species in uninvaded Greater Sage-Grouse habitat. This will be achieved by conducting systematic and strategic detection surveys, data collection, and mapping of these areas and engaging in early response efforts if invasion occurs. This will be achieved by further developing federal and state partnerships and working with local groups, such as Weed Control Districts, Cooperative Weed Management Areas, and Conservation Districts. This is the highest priority for the State of Nevada.	Objective F-VEG-ISM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG-ISM 3: —	Objective B-VEG-ISM 3: —	Objective C-VEG-ISM 3: —	Objective D-VEG-ISM 3: —	Objective E-VEG-ISM 3: Control invasive species infestations in Greater Sage-Grouse habitat already compromised by invasion. Control techniques may include: biomass removal by means such as strategic and targeted grazing, mowing, or using herbicides. In addition, the state will continue to support research in the development of biological control agents and deploy emerging technologies in Nevada as they become available.	Objective F-VEG-ISM 3: —	
Objective A-VEG-ISM 4: —	Objective B-VEG-ISM 4: —	Objective C-VEG-ISM 4: —	Objective D-VEG-ISM 4: —	Objective E-VEG-ISM 4: Monitor and adaptively manage to ensure effectiveness of efforts to prevent, control, and restore.	Objective F-VEG-ISM 4: —	
Climate Change						
Goal A-VEG-CC 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-VEG-CC 1: —	Goal C-VEG-CC 1: —	Goal D-VEG-CC 1: Use the landscape approach and promote landscape scale, ecosystem based actions to enhance resiliency and sustainability of Greater Sage-Grouse habitat to climate stress.	Goal E-VEG-CC 1:—	Goal F-VEG-CC 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG-CC 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG-CC 1: —	Objective C-VEG-CC 1: —	Objective D-VEG-CC 1: Focus treatments to restore connectivity and habitat in fragmented areas where natural recovery or restoration treatments have a moderate to high record of success and have a stable bio-climate forecast.	Objective E-VEG-CC 1: —	Objective F-VEG-CC 1: —	
Objective A-VEG-CC 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG-CC 2: —	Objective C-VEG-CC 2: —	Objective D-VEG-CC 2: Manage risks associated with landscape stressors of drought, invasive species, and wildfire exacerbated by climate change to maintain existing Greater Sage-Grouse habitat.	Objective E-VEG-CC 2: —	Objective F-VEG-CC 2: —	
Drought						
Goal A-VEG-D 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-VEG-D 1: —	Goal C-VEG-D 1: —	Goal D-VEG-D 1: Manage sagebrush ecosystems in a manner that maintains adequate forage and water for wildlife species during periods of drought.	Goal E-VEG-D 1: —	Goal F-VEG-D 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-VEG-D 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-VEG-D 1: —	Objective C-VEG-D 1: —	Objective D-VEG-D 1: Ensure authorized activities and uses do not result in degradation or net loss of PHMA during periods of drought through application of appropriate drought mitigation measures, such as ensuring adequate residual cover is available for nesting birds.	Objective E-VEG-D 1: —	Objective F-VEG-D 1: —	
Wild Horses and Burros						
Goal A- WHB 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-WHB 1: —	Goal C-WHB 1: —	Goal D-WHB 1: Manage active HMAs and HAs and WHBTs to achieve Greater Sage-Grouse habitat objectives in PHMA and GHMA.	Goal E-WHB 1: Support, promote, and facilitate: • Full implementation of the Wild Free-Roaming Horses and Burros Act of 1971 as amended, including preserving and maintaining a thriving natural ecological balance and multiple-use relationship, without alternation of its implementation by subsequent Congresses or Presidential administrations. • Maintaining healthy and diverse wild horse and burro populations in the State of Nevada in a manner that meets or is trending toward Greater Sage-Grouse habitat objectives (see Table 2-2).	Goal F-WHB 1: Reduce AMLs within HMAs and WHBTs within occupied Greater Sage-Grouse habitat by 25% to meet habitat objectives. —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				• Focusing expenditures of appropriated funds on management of wild horses and burros on public lands over care in captivity. • Acknowledging that, if action is not taken until herd health has become an issue, the range and water resources are likely to be in a highly degraded and potentially irreversible state. Non-active management (e.g., let nature take its course, wait until horse health or resource conditions are critical) is not acceptable management. • Recognizing that non-management is not acceptable, avoid negative or potentially irreversible consequences that will occur within the SGMA due to non-active management. Use all tools available and actively manage wild horses and burros within HMAs and WHBTs.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Goal A-WHB 2: —	Goal B-WHB 2: —	Goal C-WHB 2: —	Goal D-WHB 2: —	Goal E-WHB 2: As authorized in the Wild Free-Roaming Horses and Burros Act of 1971 achieve and maintain wild horses and burros at or below established AMLs within the SGMA and mange for zero horse populations in non-designated areas within the SGMA to reduce impacts on Greater Sage-Grouse habitat.	Goal F-WHB 2: —	
Goal A-WHB 3: —	Goal B-WHB 3: —	Goal C-WHB 3: —	Goal D-WHB 3: —	Goal E-WHB 3: Strive to resolve the conflicts between the Endangered Species Act and the implementation of the Wild and Free Roaming Horse and Burro Act to ensure maintenance of Greater Sage-Grouse habitat.	Goal F-WHB 3: —	
Objective A-WHB 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-WHB 1: —	Objective C-WHB 1: —	Objective D-WHB 1: Establish or adjust AML within HMAs, HAs, and Forest Service WHBTs within PHMA and GHMA that consider the life cycle requirements for Greater Sage-Grouse populations in terms of forage and nesting cover.	Objective E-WHB-1: Meet established AML levels in all HMAs and WHBTs in Core, Priority, and General Management Areas within 5 years.	Objective F-WHB 1: Reduce AMLs within HMAs, HAs, and WHBTs within occupied Greater Sage-Grouse habitat by 25% to meet habitat objectives.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-WHB 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-WHB 2: Manage wild horse and burro population levels within established AMLs.	Objective C-WHB 2: Same as Alternative A.	Objective D-WHB 2: Manage wild horse and burro population levels in PHMA and GHMA within established AMLs to maintain or enhance Greater Sage-Grouse habitat objectives.	Objective E-WHB 2: TMA-11.2: Evaluate conflicts with HMA designations within the State's Core, Priority and General Management Areas and modify LUPs to avoid negative impacts on Greater Sage-Grouse .	Objective F-WHB 2: Reduce AMLs within HMAs, HAs, and WHBTs within occupied Greater Sage-Grouse habitat by 25% to meet habitat objectives.	
Objective A-WHB 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-WHB 3: Prioritize gathers in PHMA, unless removals are necessary in other areas to prevent catastrophic environmental issues, including herd health impacts.	Objective C-WHB 3: Same as Alternative A.	Objective D-WHB 3: Prioritize gathers in HMAs, HAs and WHBTs to meet established AMLs in PHMA and GHMA, unless removals are necessary in other areas to address higher priority environmental issues, including herd health impacts.	Objective E-WHB 3: Prioritize gathers for removal and population growth suppression techniques in HMAs, HAs, and WHBTs first within the State's Core, Priority and General Management Areas. Additional prioritization should be given for HMAs and WHBTs that are near AML or where a reduction would serve the most beneficial purpose. Proactively and adaptively manage herd sizes taking into consideration climate variability and other natural phenomena, similar to the restrictions placed on livestock managers.	Objective F-WHB 3: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Fire and Fuels Management						
Goal A-FFM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-FFM 1: —	Goal C-FFM 1: —	Goal D-FFM 1: Fire, pre-/post-fire suppression and fuels management would contribute to the protection of large, contiguous blocks of sagebrush habitat that support interconnecting Greater Sage-Grouse populations.	Goal E-FFM 1: (Long-term Goal) Restore wildfire return intervals to within a spatial and temporal range of variability that supports sustainable populations of Greater Sage-Grouse and other sagebrush obligate species.	Goal F-FFM 1: —	
Goal A-FFM 2: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-FFM 2: —	Goal C-FFM 2: —	Goal D-FFM 2: Pre-suppression activities would provide conservation actions that identify and prioritize Greater Sage-Grouse habitats that are vulnerable to wildfire events and prescribe actions important for their protection.	Goal E-FFM 2: (Long-term Goal) Maintain an ecologically healthy and intact sagebrush ecosystem that is resistant to the invasion of non-native species and resilient after disturbances, such as wildfire.	Goal F-FFM 2: —	
Goal A-FFM 3: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-FFM 3: —	Goal C-FFM 3: —	Goal D-FFM 3: Pre-suppression and suppression efforts would reduce the size and impact of wildfires on Greater Sage-Grouse and their habitat.	Goal E-FFM 3:—	Goal F-FFM 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Goal A-FFM 4: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-FFM 4: —	Goal C-FFM 4: —	Goal D-FFM 4: In PHMA and GHMA, design and implement emergency stabilization and rehabilitation treatments with an emphasis on restoring existing sagebrush ecosystems damaged by wildfires, including the control of invasive species.	Goal E-FFM 4:—	Goal F-FFM 4: —	
Goal A-FFM 5: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-FFM 5: —	Goal C-FFM 5: —	Goal D-FFM 5: In PHMA, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems and strategically and effectively reduce wildfire threats in the greatest area.	Goal E-FFM 5: Continue the construction of targeted, well designed fuel breaks and "green strips" to break up fuel continuity, reduce fire size, and create safe areas for fire suppression activities. Use the best adapted plant materials to revegetate green strips with fire resistant species. Fund and schedule regular maintenance activities of green strips as needed. Avoid locating fuel breaks in Greater Sage-Grouse habitat unless no other options are available that will result in the same level of habitat protection.	Goal F-FFM 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-FFM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 1: —	Objective C-FFM 1: —	Objective D-FFM 1: Prioritize post-fire treatments in PHMA and GHMA to maximize benefits to Greater Sage-Grouse . Restoration focuses on restoring burned sagebrush areas with the appropriate cover and structure to support Greater Sage-Grouse populations.	Objective E-FFM 1: TMA-4.4: Continue identifying and obtaining funding opportunities from federal, state, local, industry and land users dedicated to implementing prioritized habitat enhancement, restoration, and conservation activities.	Objective F-FFM 1: —	
Objective A-FFM 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 2: —	Objective C-FFM 2: —	Objective D-FFM 2: In PHMA and GHMA, minimize threats from invasive species.	Objective E-FFM 2: Prevent, Control, Restore, and Monitor invasive species within the SGMA.	Objective F-FFM 2: —	
Objective A-FFM 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 3: —	Objective C-FFM 3: —	Objective D-FFM 3: Protect post-fire treatments in PHMA and GHMA from subsequent wildfires.	Objective E-FFM 3: —	Objective F-FFM 3: —	
Objective A-FFM 4: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 4: —	Objective C-FFM 4: —	Objective D-FFM 4: Retain, protect, and improve intact, unburned sagebrush communities within burned areas.	Objective E-FFM 4: TMA-3.7: Within the State's Core, Priority and General Management Areas eliminate the tactic of "burning out," including backfiring unless there are direct life safety threats.	Objective F-FFM 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-FFM 5: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 5: —	Objective C-FFM 5: —	Objective D-FFM 5: Make progress toward desired future condition (DFC) in the low elevation shrub, mountain shrubs and pinyon and/or juniper vegetation types.	Objective E-FFM 5: TMA-2.2: Continue successful landscape level habitat assessments in, and in proximity to, the State's Core, Priority and General Management Areas to identify those habitat areas that are at the highest risk of wildland fire.	Objective F-FFM 5: —	
Objective A-FFM 6: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 6: —	Objective C-FFM 6: —	Objective D-FFM 6: Design post-fuels management projects to ensure long-term persistence of seeded fuel breaks and green strips protecting native vegetation.	Objective E-FFM 6: TMA-2.8: Continue to successfully treat existing areas of invasive vegetative that pose a threat to within the State's Core, Priority and General Management Areas through the use of herbicides, fungicides or bacteria to control cheatgrass and medusahead infestations.	Objective F-FFM 6: —	
Objective A-FFM 7: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 7: —	Objective C-FFM 7: —	Objective D-FFM 7: Provide for sufficient Unit staffing for initial attack response to wild land fires in PHMA and GHMA.	Objective E-FFM 7: TMA-3.4: Increase initial attack capability by training and equipping volunteer firefighters, as well as agricultural and other industry work forces for assignment during periods of high fire activity. Trained volunteers who are remotely located will serve as first responders when necessary and appropriate.	Objective F-FFM 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-FFM 8: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-FFM 8: —	Objective C-FFM 8: —	Objective D-FFM 8: Fire Management Plans reflect guidance for wildland fire suppression in PHMA and GHMA and take into consideration Greater Sage-Grouse sub-population areas.	Objective E-FFM 8: TMA-3.8: Designate Greater Sage-Grouse habitat in the SGMA as a "high priority value" for suppression resource allocation in the Geographical Area Coordination Centers and within the FEMA Fire Management Assistance Grant criteria.	Objective F-FFM 8: —	
Livestock Grazing						
Goal A-LG 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-LG 1: —	Goal C-LG 1: —	Goal D-LG 1: Manage livestock grazing to maintain and/or enhance PHMA and GHMA to meet all life cycle requirements of the Greater Sage-Grouse during permit administration.	Goal E-LG 1: Ensure that existing grazing permits maintain or enhance Greater Sage-Grouse habitat. Utilize livestock grazing when appropriate as a management tool to improve Greater Sage-Grouse habitat quantity, quality, or to reduce wildfire threats. Based on a comprehensive understanding of seasonal Greater Sage-Grouse habitat requirements, and in conjunction with the need for flexibility in livestock operations, cooperatively make timely, seasonal range management decisions to meet vegetation management objectives, including fuels reduction.	Goal F-LG 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LG 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LG 1: —	Objective C-LG 1: —	Objective D-LG 1: In PHMA and GHMA, manage for vegetation composition and structure consistent with ecological site potential to achieve Greater Sage-Grouse seasonal habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Objective E-LG 1: In Greater Sage-Grouse habitat, manage for vegetation composition and structure that achieves Greater Sage-Grouse seasonal habitat objectives (see Table 2-2), enhancing resilience and resistance based on the ability of the ecological site to respond to management. This objective recognizes spatial and temporal variations across seral stages.	Objective F -LG 1: —	
Objective A-LG 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LG 2: —	Objective C-LG 2: —	Objective D-LG 2: Manage lentic and lotic riparian areas in PHMA and GHMA to maintain a component of perennial forbs with diverse species richness and maintain suitable cover; manage adjacent upland habitat to promote adjacent cover relative to site potential to facilitate brood rearing (see Table 2-11 in section 2.8.5 of this Chapter).	Objective: E-LG 2: In Greater Sage-Grouse habitat, manage for vegetation composition and structure that achieves Greater Sage-Grouse seasonal habitat objectives (see Table 2-2), enhancing resilience and resistance based on the ability of the ecological site to respond to management. This objective recognizes spatial and temporal variations across seral stages.	Objective F-LG 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LG 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B- LG 3: —	Objective C-LG 3: —	Objective D-LG 3: —	Objective E-LG 3: —	Objective F-LG 3: Encourage partners to monitor effects of retiring grazing permits in Greater Sage-Grouse habitat.	
Recreation and Visitor Services						
Goal A-REC 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-REC 1: —	Goal C-REC 1: —	Goal D-REC 1: In PHMA and GHMA, manage recreation and visitor services in a manner that provides for quality visitor experience on public lands while minimizing human disturbance to Greater Sage-Grouse and its life cycle requirements.	Goal E-REC 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including recreational activities, in order to stop the decline of Greater Sage-Grouse populations. This will be achieved by the overriding policy for all management actions within the SGMA to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat.	Goal F-REC 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-REC 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-REC 1: —	Objective REC 1: —	Objective D-REC 1: In PHMA and GHMA, manage commercial and noncommercial motorized and nonmotorized recreation uses on public lands in a manner compatible with the life-cycle requirements for Greater Sage-Grouse .	Objective E-REC 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including commercial and noncommercial motorized and nonmotorized recreation uses on public lands in order to stop the decline of Greater Sage-Grouse populations. This will be achieved by the overriding policy for all management actions within the SGMA to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat.	Objective F-REC 1: —	
Comprehensive Travel and Transportation Management (CTTM)						
Goal A-CTTM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-CTTM 1: —	Goal C-CTTM 1: —	Goal D-CTTM 1: Manage travel and transportation in a manner that maintains healthy and intact PHMA and GHMA, minimizes disturbance to Greater Sage-Grouse populations, and provides for reasonable access to public lands.	Goal E-CTTM 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including travel and transportation, in order to stop the decline of Greater Sage-Grouse populations. This will be achieved by the overriding policy for all management actions within the SGMA to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat.	Goal F-CTTM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-CTTM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-CTTM 1: —	Objective C-CTTM 1: N—	Objective D-CTTM 1: Prioritize and complete transportation planning in PHMA and GHMA that provides for reasonable access to public lands for administrative and recreational purposes and that minimizes proliferation of user-created routes (roads, primitive roads, and trails).	Objective E-CTTM 1: —	Objective F-CTTM 1: —	
Objective A-CTTM 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-CTTM 2: —	Objective C-CTTM 2: —	Objective D-CTTM 2: Manage motorized travel on public lands by designating routes in PHMA and GHMA that are compatible with the life-cycle requirements for Greater Sage-Grouse .	Objective E-CTTM 2: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances including motorized travel through the application of "avoid, minimize and mitigate", in the SGMA in order to stop the decline of Greater Sage-Grouse populations.	Objective F-CTTM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Lands and Realty						
Goal A-LR 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-LR 1: —	Goal C-LR 1: —	Goal D-LR 1: Manage land tenure adjustments and land uses to maintain or enhance PHMA and GHMA and connectivity.	Goal E-LR 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including land tenure adjustments and land uses, in order to stop the decline of Greater Sage-Grouse populations. This will be achieved by the overriding policy for all management actions within the SGMA to "avoid, minimize, and mitigate" impacts on Greater Sage-Grouse habitat.	Goal F-LR 1: —	
Objective A-LR 1: —	Objective B-LR 1: —	Objective C-LR 1: —	Objective D-LR 1: —	Objective E-LR 1: *Avoid* - Eliminate conflicts by relocating disturbance activities outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-LR 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LR 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LR 2: —	Objective C-LR 2: —	Objective D-LR 2: Manage and minimize effects of land use authorizations on PHMA and GHMA through grant stipulations and terms and conditions.	Objective E-LR 2: *Minimize* –If impacts are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and/or developing permit conditions to include measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.	Objective F-LR 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LR 3: —	Objective B-LR 3: —	Objective C-LR 3: —	Objective D-LR 3: —	Objective E -LR 3: *Mitigate* – If impacts are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-LR 3: —	
Fluid Minerals						
Goal A-Lease-FM 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-Lease-FM 1: —	Goal C-Lease-FM 1: —	Goal D-Lease-FM 1: Manage the Federal Fluid Mineral Estate to meet National energy needs in a development framework that gives priority consideration to maintaining or increasing Greater Sage-Grouse populations and distribution.	Goal E-Lease-FM 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including Fluid Minerals, in order to stop the decline of Greater Sage-Grouse populations. Apply the hierarchical decision process of "avoid, minimize, mitigate" to achieve this goal.	Goal F-Lease-FM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-Lease-FM 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-Lease-FM 1: —	Objective C-Lease-FM 1: Any oil, gas, geothermal activity will be conducted to maximize avoidance of impacts, based on evolving scientific knowledge of impacts.	Objective D-Lease-FM 1: —	Objective E-Lease-FM 1: *Avoid* - Eliminate conflicts by relocating disturbance activities, including Fluid Minerals, outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-Lease-FM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-Lease-FM 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-Lease-FM 2: —	Objective C-Lease-FM 2: N—	Objective D-Lease-FM 2: Conserve and maintain the quality and distribution of PHMA and GHMA through application of lease stipulations, COAs, and RDFs (consistent with applicable law) on existing and future leases.	Objective E-Lease-FM 2: *Minimize* –If impacts from Fluid Minerals are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and developing permit conditions with measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does <u>not</u> preclude the need for mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.	Objective F-Lease-FM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-Lease-FM 3: —	Objective B-Lease-FM 3: —	Objective C-Lease-FM 3: —	Objective D-Lease-FM 3: —	Objective E-Lease-FM 3: *Mitigate* – If impacts from Fluid Minerals are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-Lease-FM 3: —	
Locatable Minerals						
Goal A-LOC 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-LOC 1: —	Goal C-LOC 1: —	Goal D-LOC 1: Manage locatable mineral development to consider effects on PHMA.	Goal E-LOC 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including Locatable Minerals, in order to stop the decline of Greater Sage-Grouse populations. Apply the hierarchical decision process of "avoid, minimize, mitigate" to achieve this goal.	Goal F-LOC 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LOC 1: —	Objective B-LOC 1: —	Objective C-LOC 1: —	Objective D-LOC 1: —	Objective E-LOC 1: *Avoid* - Eliminate conflicts by relocating disturbance activities, including Locatable Minerals, outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-LOC 1: —	
Objective A-LOC 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LOC 2: —	Objective C-LOC 2: —	Objective D-LOC 2: Authorize Plans of Operation per 43 CFR 3809 regulations that minimize impacts on Greater Sage-Grouse PHMA and GHMA.	Objective E-LOC 2: *Minimize* –If impacts from Locatable Minerals (including Plans of Operation per 43 CFR 3809 regulations) are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and/ or developing permit conditions to include measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for	Objective F-LOC 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.		
Objective A-LOC 3: —	Objective B-LOC 3: —	Objective C-LOC 3: —	Objective D-LOC 3: —	Objective LOC 3: *Mitigate* – If impacts from Locatable Minerals are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-LOC 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-LOC 4: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LOC 4: —	Objective C-LOC 4: —	Objective D-LOC 4: Provide reasonable access and development opportunity to claimants in PHMA, consistent with rights provided under the General Mining Act of 1872, as amended, and the need to conserve, maintain, or enhance PHMA through prevention of undue or unnecessary degradation for activities not reasonably incident to explore and develop the resource.	Objective E-LOC 4:—	Objective F-LOC 4: —	
Objective A-LOC 5: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-LOC 5: —	Objective C-LOC 5: —	Objective D-LOC 5: Manage disturbances associated with notice level activity in PHMA on a landscape basis by encouraging operators and claimants to consolidate exploration activities into exploration plans of operation to reduce proliferation of discrete mining notices per 43 CFR 3809.21(b).	Objective E-LOC 5: Anthropogenic disturbances, including mineral exploration, are subject to the hierarchical decision process of avoid, minimize, and mitigate described above.	Objective F-LOC 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Salable Minerals						
Goal A-SAL 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-SAL 1: —	Goal C-SAL 1: —	Goal D-SAL 1: Manage salable minerals to meet the State's demand for sand, gravel, and rock materials while providing for conservation and maintenance or enhancement of PHMA.	Goal E-SAL 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including Salable Minerals, in order to stop the decline of Greater Sage-Grouse populations. Apply the hierarchical decision process of "avoid, minimize, mitigate" to achieve this goal.	Goal F-SAL 1: —	
Objective A-SAL 1: —	Objective B-SAL 1: —	Objective C-SAL 1: —	Objective D-SAL 1: —	Objective E-SAL 1: *Avoid* - Eliminate conflicts by relocating disturbance activities, including Salable Minerals, outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-SAL 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SAL 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SAL 2: —	Objective C-SAL 2: —	Objective D-SAL 2: Minimize disturbances from salable mineral activities in PHMA and GHMA.	Objective E-SAL 2: *Minimize* – If impacts from Salable Minerals are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and developing permit conditions with measures that lessen the adverse effects on Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.	Objective F-SAL 2: —	
Objective A-SAL 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SAL 3: —	Objective C-SAL 3: —	Objective D-SAL 3: Provide reasonable access and development opportunity to Federal Highway Administration, NDOT, and Counties and the public for existing mineral materials pits in PHMA and GHMA.	Objective E-SAL 3: TMA-15.1: —	Objective F-SAL 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-SAL 4: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-SAL 4: —	Objective C-SAL 4: —	Objective D-SAL 4: Conserve and maintain the quality and distribution of Greater Sage-Grouse habitat through on-site and off-site mitigation to achieve no net un-mitigated loss of PHMA or provide for the enhancement of PHMA within the WAFWA management zone.	Objective SAL 4: *Mitigate* – If impacts from Salable Minerals are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-SAL 4: —	
Nonenergy Leasable Minerals						
Goal A-NEL 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-NEL 1: —	Goal C-NEL 1: —	Goal D-NEL 1: Manage nonenergy leasable minerals to maintain or increase Greater Sage-Grouse populations and distribution.	Goal E-NEL 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including Nonenergy Leasable Minerals, in order to stop the decline of Greater Sage-Grouse populations. Apply the hierarchical decision process of "avoid, minimize, mitigate" to achieve this goal.	Goal F-NEL 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-NEL 1: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-NEL 1: —	Objective C-NEL 1: —	Objective D-NEL 1: Conserve and maintain the quality and distribution of PHMA and GHMA.	Objective E-NFL 1: *Avoid* - Eliminate conflicts by relocating disturbance activities, including Nonenergy Leasable Minerals, outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-NEL 1: —	
Objective A-NEL 2: —	Objective B-NEL 2: —	Objective C-NEL 2: —	Objective D-NEL 2: —	Objective E-NEL 2: *Minimize* – If impacts from Nonenergy Leasable Minerals (including Plans of Operation per 43 CFR 3809) are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and developing permit conditions with measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for	Objective F-NEL 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.		
Objective A-NEL 3: —	Objective B-NEL 3: —	Objective C-NEL 3: —	Objective D-NEL 3: —	Objective E-NEL 3: *Mitigate* – If impacts from Nonenergy Leasable Minerals are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-NEL 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Mineral Split Estate						
Goal A-MSE 1: No common goal across LUPs within the sub-region. See Section 2.10.1.	Goal B-MSE 1: —	Goal C-MSE 1: —	Goal D-MSE 1: Manage federal split estate to provide for the conservation, maintenance and enhancement of PHMA and GHMA.	Goal E-MSE 1: Within the SGMA, achieve no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances, including federal split estate, in order to stop the decline of Greater Sage-Grouse populations. Apply the hierarchical decision process of "avoid, minimize, mitigate" to achieve this goal.	Goal F-MSE 1: —	
Objective A-MSE 1: —	Objective B-MSE 1: —	Objective C-MSE 1: —	Objective D-MSE 1: —	Objective E-MSE 1: *Avoid* - Eliminate conflicts by relocating disturbance activities, including federal split estate, outside of Greater Sage-Grouse habitat in order to conserve Greater Sage-Grouse and their habitat. Avoidance of a disturbance within Greater Sage-Grouse habitat is the preferred option.	Objective F-MSE 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-MSE 2: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-MSE 2: —	Objective C-MSE 2: —	Objective D-MSE 2: For federal mineral estate, minimize surface disturbance in PHMA and GHMA to the maximum extent practicable on private surface.	Objective E-MSE 2: *Minimize* – If impacts from federal split estate are not avoided, the adverse effects will need to be both minimized and mitigated. Impacts will be minimized by modifying proposed actions and developing permit conditions with measures that lessen the adverse effects to Greater Sage-Grouse and their habitat. This will be accomplished through Site-Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co-location of structures. Minimization does not preclude the need for mitigation of a disturbance. Any disturbance in habitat within the SGMA will require both minimization and mitigation.	Objective F-MSE 2: —	
Objective A-MSE 3: No common objective across LUPs within the sub-region. See Section 2.10.1.	Objective B-MSE 3: —	Objective C-MSE 3: —	Objective D-MSE 3: For federal surface estate, minimize surface disturbance in PHMA and GHMA to the maximum extent practicable consistent with use rights to the private mineral estate.	Objective E-MSE 3: see Objective E-MSE 2	Objective F-MSE 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Objective A-MSE 4: —	Objective B-MSE 4: —	Objective C-MSE 4: —	Objective D-MSE 4: —	Objective E-MSE 4: *Mitigate* – If impacts from federal split estate are not avoided, after required minimization measures are specified, residual adverse effects on designated Greater Sage-Grouse habitat are required to be offset by implementing mitigation actions that will result in replacement or enhancement of the Greater Sage-Grouse habitat to balance the loss of habitat from the disturbance activity. This will be accomplished through the Conservation Credit System.	Objective F-MSE 4: —	

*Alternative E was submitted by the State of Nevada's Governor's office and only covers land within the decision area in the State of Nevada. The State of California lands will follow Alternative A.

[1]The use of "**—**" indicates that there is no similar goal or objective, or that the similar goal or objective is reflected in another management action in the alternative.

Table 2-2c (Part 2)
Description of Alternative Actions

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Special Status Species (Greater Sage-Grouse)						
Action A-SSS 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 1: —[1]	Action C-SSS 1: —	Action D-SSS 1: Identify seasonal habitat areas where an array of conservation actions can be completed to improve habitat conditions.	Action E-SSS 1: PMA-2.2: Identify and prioritize landscape-scale enhancement, restoration, fuel reduction, and mitigation projects based upon ecological site potential, state, and transition models, and other data that will contribute to decision making informed by science to increase rangeland resiliency prior to and following wildfire.	Action F-SSS 1: —	
Action A-SSS 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 2: —	Action C-SSS 2: —	Action D-SSS 2: Work cooperatively to establish and maintain a Greater Sage-Grouse telemetry database to help prioritize habitat conservation actions.	Action E-SSS 2: TMA-22.12: Satellite telemetry data shall be compiled and provided to the Nevada Sagebrush Ecosystem Technical Team for local plan revisions and updates, and coordinated statewide to determine seasonal habitats such as breeding, nesting, brood rearing; movement patterns; and survival rates.	Action F-SSS 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 3: —	Action C-SSS 3 —	Action D-SSS 3: —	Action E-SSS 3: TMA 9.4: Address and eliminate conflicting regulations between the Migratory Bird Treaty Act and the ESA. Pursue additional take permits in excess of the current 2,000 bird limit from the USFWS for raven l. If necessary, pursue additional raven take in excess of the current 2,000 bird limit from the USFWS for raven control.	Action F-SSS 3: —	
Action A-SSS 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 4: —	Action C-SSS 4: —	Action D-SSS 4: —	Action E-SSS 4: TMA 9.6: Monitor effects of predator control to determine causal relations with Greater Sage-Grouse survivability and adapt control strategies accordingly.	Action F-SSS 4: —	
Action A-SSS 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 5: —	Action C-SSS 5: —	Action D-SSS 5: —	Action E-SSS 5: TMA 9.6: When downward population trends and nesting success are detected in the SGMAs initiate predator surveys and identify responsible predator species to target and implement an effective predator control effort.	Action F-SSS 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 6: —	Action C-SSS 6: —	Action D-SSS 6: —	Action E-SSS 6: Implement a predator control program to reduce transient raven populations for nest protection and increased chick survival throughout the interim period while habitat enhancement and restoration projects become established. Greater Sage-Grouse population, nest success and recruitment goals should be established within the SGMA.	Action F-SSS 6: —	
Action A-SSS 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS 7: —	Action C-SSS 7: —	Action D-SSS 7: Implement the RDFs, consistent with applicable law, in areas outside of mapped PHMA and GHMA where Greater Sage-Grouse use has been observed or suspected, areas and habitats which may be necessary to maintain viability of Greater Sage-Grouse , or where the activity would affect Greater Sage-Grouse or their habitat in PHMA or GHMA.	Action E-SSS 7: Site-Specific Consultation Based Design Features apply to anthropogenic disturbances in the SGMA, including the Non-Habitat Management Category.	Action F-SSS 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Adaptive management						
Action A-SSS-AM 1: No common action across LUPs within the sub-region. See **Section 2.10.1**.	Action B-SSS-AM 1: —	Action C-SSS-AM 1: —	Action D-SSS-AM 1: Establish a protocol for incorporating new science and changes over time, to update and keep State-wide habitat maps current.	Action E-SSS-AM 1: See Role of Sagebrush Ecosystem Technical Team.	Action F-SSS-AM 1: —	
Action A-SSS-AM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 2: —	Action C-SSS-AM 2: —	Action D-SSS-AM 2: Continue to consult with the NDOW for all development or habitat restoration proposals in PHMA and GHMA. Also, coordinate with the Nevada Sagebrush Ecosystem Council, the CDFW and tribes on projects proposed within sagebrush ecosystems	Action E-SSS-AM 2: *SETT Consultation* – Proposed anthropogenic disturbances within the SGMA will trigger consultation with the SETT for assessment of impacts on Greater Sage-Grouse and their habitat and compliance with SEC and other relevant agency policies. SETT consultation is designed to provide a regulatory mechanism to ensure that Greater Sage-Grouse conservation policies are applied consistently throughout the state and streamline the federal permitting process. Anthropogenic disturbance is defined here as any human-caused activity or action and/ or human-created physical structures that may have adverse impacts on Greater Sage-Grouse or	Action F-SSS-AM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				their habitat. The term anthropogenic disturbance and its associated conservation policies will include, but not limited to the following project categories: mineral development and exploration and its associated infrastructure; renewable and non-renewable energy production, transmission, and distribution and its associated infrastructure; paved and unpaved roads and highways; cell phone towers; landfills; pipelines; residential and commercial subdivisions; special use permits; ROW applications; and other large-scale infrastructure development. Livestock operations and agricultural activities and infrastructure related to small-scale ranch and farm businesses (e.g. water troughs, and fences) are not included in this definition.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-AM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 3: —	Action C-SSS-AM 3: —	Action D-SSS-AM 3: Identify off-site mitigation areas within GHMA with reasonable potential to achieve vegetation objectives and meet the seasonal habitat needs of Greater Sage-Grouse . These are areas where mitigation would occur for application of off-site mitigation actions.	Action E-SSS-AM 3: Options for mitigation will be identified in the State's Strategic Action Plan. The State's Strategic Action Plan will identify prioritized areas on public and private lands to implement a landscape scale restoration effort. This will spatially identify where the primary threats to Greater Sage-Grouse habitat are located throughout the state and provide management guidance for how to ameliorate these based on local area conditions and ecological site descriptions. The prioritization includes efforts to use mitigation funding in areas where Greater Sage-Grouse will derive the most benefit, even if those areas are not adjacent to or in the vicinity of impacted populations. This Strategic Action Plan will be updated at least every 5 years to reflect improvements in understanding and technology for mitigation activities.	Action F-SSS-AM 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-AM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 4: —	Action C-SSS-AM 4: —	Action D-SSS-AM 4: Natural Resources Conservation Service (NRCS), BLM, and Forest Service will engage private landholders to improve habitat conditions.	Action E-SSS-AM 4: —	Action F-SSS-AM 4: —	
Action A-SSS-AM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 5: —	Action C-SSS-AM 5: —	Action D-SSS-AM 5: —	Action E-SSS-AM 5: Through the Nevada Sagebrush Ecosystem Council, and its Nevada Sagebrush Ecosystem Technical Team, utilizing the avoid, minimize, and mitigate strategy, the following will occur: • Develop consistent monitoring protocols and methods to be used across all land jurisdictions and agencies. Compile all project monitoring data into one Greater Sage-Grouse database managed by the Nevada Sagebrush Ecosystem Technical Team for use in adaptive management and reporting. • Monitoring of mitigation sites must be included in all plans, with consistent protocols to assess specific metrics and determine trends for	Action F-SSS-AM 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				habitat quantity/quality and Greater Sage-Grouse populations. • All statewide monitoring data will be accessible to the Nevada Sagebrush Technical Team through a centralized geographic database. The team will compile annual reports of habitat trends. All monitoring plans must include specific objectives and detailed procedures. • Monitor Greater Sage-Grouse activity and demographics with annual assessments and intensive levels of investigation to answer questions about the effectiveness of conservation strategies in terms of measured responses of key demographic parameters (e.g. nest success, chick survival, and movement) associated with sites where management activities have been implemented. • Conduct annual lek counts across most Population Management Units. Train volunteers		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				who provide additional manpower in assisting with additional lek counts. Volunteers must be qualified by attending a day-long training session that includes actual field training each year. • Population demographic data is determined from the Greater Sage-Grouse harvest. Hunters shall deposit one wing from each bird harvested in wing barrels located on primary hunting access roads, check stations, or to be delivered to a NDOW Field or Regional Office. Wings shall be separated by geographic locations (county or hunt area). Wings shall be used to identify sex, age, nest success, and number of chicks per hen. • Monitor harvest through the use of the 10% Hunter Questionnaire that randomly polls license holders and through the collection of Greater Sage-Grouse wings from hunter harvested birds.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				• Regulate harvest by season length and bag limit as set forth by the Nevada Board of Wildlife Commissioners and, consulting recommendations made by the NDOW. • In areas that are closed to hunting, wing data are not available for monitoring population demographics such as the number of chicks per hen. For these areas, conduct brood counts along established routes. Brood surveys shall be conducted mid-summer when Greater Sage-Grouse are concentrated on meadow habitats. Established brood count routes shall be surveyed to record average brood size and the number of chicks per hen. • Satellite telemetry data shall be compiled and provided to the Nevada Sagebrush Ecosystem Technical Team for local plan revisions and updates, and coordinated statewide to determine seasonal		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				habitats such as breeding, nesting, brood rearing; movement patterns; and survival rates. • Appropriate state and federal agencies will continue to coordinate with the US Geological Survey, Biological Resources Division and associated National Wildlife Health Center to conduct investigations into the effects of West Nile virus and other disease pathogens on Greater Sage-Grouse.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-AM 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 6: —	Action C-SSS-AM 6: —	Action D-SSS-AM 6: —	Action E-SSS-AM 6: When population, nesting success, and recruitment goals are not met, implement an effective predator control effort for ravens, badgers, and coyotes as needed, based on biological assessments appropriate to local conditions. Conduct predator control to coincide with the life stage impacted by predation. The SGMA should be prioritized for predator control. If the SGMA meets or exceeds the reproductive and population objectives, move predator control to the next lower SGMA priority.	Action F-SSS-AM 6: —	
Action A-SSS-AM 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 7: —	Action C-SSS-AM 7: —	Action D-SSS-AM 7: The agencies would coordinate with the Nevada Sagebrush Technical Team on all proposed disturbances within the state of Nevada to meet the mutual goal of no unmitigated loss.	Action E-SSS-AM 7: See SETT Consultation (Action E-SSS-AM 2).	Action F-SSS-AM 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-AM 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 8: —	Action C-SSS-AM 8: —	Action D-SSS-AM 8: The BLM and Forest Service would coordinate with the Nevada Sagebrush Technical Team on the application of the Conservation Credit System (once it is established) for mitigation of activities that disturb Greater Sage-Grouse habitat within Nevada where the application of the mitigation would occur on or the credit would be applied to disturbance on Public or National Forest Lands.	Action E-SSS-AM 8: Consult with the SETT per Action E-SSS-AM 2.	Action F-SSS-AM 8: —	
Action A-SSS-AM 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-AM 9: —	Action C-SSS-AM 9: —	Action D-SSS-AM 9: Greater Sage-Grouse habitat categorization and use management boundaries would be evaluated and adjusted based on continuing inventory and monitoring results every five years. Adjustments up to plus or minus ten percent of the mapped habitat within the population management zone would be made without further analysis.	Action E-SSS-AM 9: Greater Sage-Grouse management categories must be evaluated every 3-5 years, based on new or improved spatial data through a scientifically based, peer-reviewed process. Adjustments of the mapped management categories within the population management zone would be made without further analysis.	Action F-SSS-AM 9: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Climate Change						
Action A-SSS-CC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-CC 1: —	Action C-SSS-CC 1: —	Action D-SSS-CC 1: As climate change data become available through REAs or other ecological studies, identify areas of unfragmented Greater Sage-Grouse habitat and key habitat linkages that provide the life-cycle and genetic transfer needs for Greater Sage-Grouse . Manage the identified areas as PHMA.	Action E-SSS-CC 1: —	Action F-SSS-CC 1: —	
Action A-SSS-CC 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-CC 2: —	Action C-SSS-CC 2: —	Action D-SSS-CC 2: Work cooperatively with multiple agencies and stakeholders to establish and maintain a network of climate monitoring sites and stations.	Action E-SSS-CC 2: —	Action F-SSS-CC 2: —	
Disease						
Action A-SSS-DIS 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-DIS 1: —	Action C-SSS-DIS 1: —	Action D-SSS-DIS 1: When developing or modifying water developments on public lands in PHMA and GHMA, use RDFs consistent with applicable law to mitigate potential impacts from West Nile virus.	Action E-SSS-DIS 1: When developing or modifying water developments on BLM-administered lands in the SGMA, use Site-Specific Consultation-Based Design Features to mitigate potential impacts from West Nile virus.	Action F-SSS-DIS 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Mitigation						
Action A-SSS-MIT 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 1: No similar action	Action C-SSS-MIT 1: No similar action	Action D-SSS-MIT 1: —	Action E-SSS-MIT 1: PMA-3: TBD	Action F-SSS-MIT 1: —	
Action A-SSS-MIT 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 2: —	Action C-SSS-MIT 2: —	Action D-SSS-MIT 2: —	Action E-SSS-MIT 2: PMA-3.1: TBD	Action F-SSS-MIT 2: —	
Action A-SSS-MIT 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 3: —	Action C-SSS-MIT 3: —	Action D-SSS-MIT 3: —	Action E-SSS-MIT 3: PMA-3.2: TBD	Action F-SSS-MIT 3: —	
Action A-SSS-MIT 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 4: —	Action C-SSS-MIT 4: —	Action D-SSS-MIT 4: —	Action E-SSS-MIT 4: PMA-3.3: TBD	Action F-SSS-MIT 4: —	
Action A-SSS-MIT 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 5: —	Action C-SSS-MIT 5: —	Action D-SSS-MIT 5: —	Action E-SSS-MIT 5: PMA-3.4: TBD	Action F-SSS-MIT 5: —	
Action A-SSS-MIT 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 6: —	Action C-SSS-MIT 6: —	Action D-SSS-MIT 6: —	Action E-SSS-MIT 6: PMA-3.5: TBD	Action F-SSS-MIT 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-MIT 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 7: —	Action C-SSS-MIT 7: —	Action D-SSS-MIT 7: —	Action E-SSS-MIT 7: MA-3.6: TBD	Action F-SSS-MIT 7: —	
Action A-SSS-MIT 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-MIT 8: —	Action C-SSS-MIT 8: —	Action D-SSS-MIT 8: —	Action E-SSS-MIT 8: TMA-21: TBD	Action F-SSS-MIT 8: —	
Administrative Collaboration and decision making						
Action A-SSS-ACDM 1: —	Action B-SSS-ACDM 1: —	Action C-SSS-ACDM 1: —	Action D-SSS-ACDM 1: —	Action E-SSS-ACDM 1: *SETT Consultation* – Proposed anthropogenic disturbances within the SGMA will trigger consultation with the SETT for assessment of impacts on Greater Sage-Grouse and their habitat and compliance with SEC and other relevant agency policies. SETT consultation is designed to provide a regulatory mechanism to ensure that Greater Sage-Grouse conservation policies are applied consistently throughout the state and streamline the federal permitting process. This is the mechanism to apply the hierarchical "avoid, minimize, mitigate" policy described below.	Action F-SSS-ACDM 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Anthropogenic disturbance is defined here as any human-caused activity or action or human-created physical structures that may have adverse impacts on Greater Sage-Grouse and their habitat. The term anthropogenic disturbance and its associated conservation policies will include, but not limited to the following project categories: mineral development and exploration and its associated infrastructure; renewable and non-renewable energy production, transmission, and distribution and its associated infrastructure; paved and unpaved roads and highways; cell phone towers; landfills; pipelines; residential and commercial subdivisions; special use permits; right-of-way applications; and other large-scale infrastructure development. Livestock operations and agricultural activities and infrastructure related to small-scale ranch and farm businesses (e.g. water troughs and fences) are		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				not included in this definition, though Appendix D [of the 2015 Final EIS] (Site-Specific Consultation-Based Design Features) addresses how to minimize impacts on Greater Sage-Grouse and their habitat from these activities.		
Action A-SSS-ACDM 2: —	Action B-SSS-ACDM 2: —	Action C-SSS-ACDM 2: —	Action D-SSS-ACDM 2: —	Action E-SSS-ACDM 2: Determination of Greater Sage-Grouse habitat will be based on the USGS Habitat Suitability Map (Figure XX). At the onset of a proposed project, habitat evaluations or "ground-truthing" of the project site and its surrounding areas shall be conducted by a qualified biologist with Greater Sage-Grouse experience using methods as defined in Stiver et al (2010) to confirm habitat type. Evaluations can be conducted by the SETT or NDOW at the request of the project proponent.	Action F-SSS-ACDM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-ACDM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 3: —	Action C-SSS-ACDM 3: —	Action D-SSS-ACDM 3: —	Action E-SSS-ACDM 3: *Avoid* – Project proponents must first seek to avoid disturbance in Greater Sage-Grouse habitat within the SGMA. If the project is located entirely outside of habitat, but within the SGMA it will still be analyzed for indirect effects, such as noise and visual impacts. A project will only be considered to have avoided impacts if it is physically located in non-habitat and it is determined to have no indirect impacts effecting designated habitat within the SGMA. If this is determined, no further consultation with the SETT is required. Anthropogenic disturbances should be avoided within the SGMA. If avoidance is not possible, the project proponent must demonstrate why it is not possible in order for the SETT to consider minimization and mitigation alternatives. The process to demonstrate that avoidance is not possible (the "avoid process") is determined by	Action F-SSS-ACDM 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				four management categories, which consider both Greater Sage-Grouse breeding population density and habitat suitability within the SGMA. The burden of proof to demonstrate that avoidance is not possible within the SGMA will be on the project proponent and will require the project proponent to demonstrate the specified criteria listed below as determined by the management categories the proposed project is located in. Exemptions to the avoid policy will be granted if all the criteria below is met. A higher burden of proof is set for project proponents to demonstrate that avoidance is not possible in areas that have higher densities of Greater Sage-Grouse populations and suitable habitat. *Core Management Areas* Project proponents must seek to avoid disturbances within the SGMA. If the project proponent wishes to demonstrate that		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				avoidance is not possible within these areas, exemptions will be granted to this restriction as part of the SETT consultation. The project proponent must demonstrate that all of the following criteria listed below are met as part of the SETT consultation process in order to be granted an exemption: • Demonstrate that the project cannot be reasonably accomplished elsewhere – the purpose and need of the project could not be accomplished in an alternative location. • Demonstrate that the individual and cumulative impacts of the project would not result in habitat fragmentation or other impacts that would cause Greater Sage-Grouse populations to decline through consultation with the SETT. • Demonstrate that Greater Sage-Grouse population trends within the PMU are stable or increasing over a 10-		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				year rolling average. • Demonstrate that project infrastructure will be co-located with existing disturbances to the greatest extent possible. • Develop Site-Specific Consultation-Based Design Features to minimize impacts through consultation with the SETT. • Mitigate unavoidable impacts through compensatory mitigation via the Conservation Credit System. Mitigation rates will be higher for disturbances within this category. *Priority Management Areas* Management in these areas provide more flexibility to project proponents, though avoidance in these areas is still the preferred option and project proponents are encouraged to develop outside of these areas whenever possible. Anthropogenic disturbances will be permitted in these areas if the criteria listed below are met as part of the		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				SETT consultation process: • Demonstrate that the project cannot be reasonably or feasibly accomplished elsewhere – the purpose and need of the project could not be accomplished in an alternative location. • Demonstrate that project infrastructure will be co-located with existing disturbances to the greatest extent possible. If co-location is not possible, siting should reduce individual and cumulative impacts on Greater Sage-Grouse and their habitat. • Demonstrate that the project should not result in unnecessary and undue habitat fragmentation that may cause declines in Greater Sage-Grouse populations within the PMU through consultation with the SETT. • Develop Site-Specific Consultation-Based Design Features to minimize impacts through consultation		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				with the SETT. • Mitigate for unavoidable impacts through compensatory mitigation via the Conservation Credit System. *General Management Areas* Management of these areas provides the greatest flexibility to project proponents. Anthropogenic disturbances will be permitted in these areas if the criteria listed below are met as part of the SETT consultation process: • Demonstrate that the project cannot be reasonably or feasibly accomplished elsewhere – the purpose and need of the project could not be accomplished in an alternative location. • Demonstrate that project infrastructure will be co-located with existing disturbances to the greatest extent possible. • Develop Site-Specific Consultation-Based Design Features to minimize impacts		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				through consultation with the SETT. • Mitigate for unavoidable impacts through compensatory mitigation via the Conservation Credit System. *Non-Habitat Management Areas* All proposed projects within the SGMA, including in non-habitat within the SGMA must conduct habitat evaluation or ground-truthing to confirm presence or absence of Greater Sage-Grouse habitat. If areas are confirmed by habitat evaluations to be non-habitat, an analysis for indirect impacts on Greater Sage-Grouse within their habitat in the SGMA will be required to determine if Site-Specific Consultation-Based Design Features to minimize impacts and compensatory mitigation are necessary as part of the SETT consultation process.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-ACDM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 4: —	Action C-SSS-ACDM 4: —	Action D-SSS-ACDM 4: —	Action E-SSS-ACDM 4: ***Minimize*** - If a project cannot avoid adverse effects (direct or indirect) to Greater Sage-Grouse habitat within the SGMA, the project proponent will be required to implement Site-Specific Consultation-Based Design Features that minimize the project's adverse effects on Greater Sage-Grouse habitat. Minimization will include consultation with the SETT to determine which Site-Specific Consultation-Based Design Features would be most applicable to the project when considering site conditions and types of disturbance. Some general examples could include: reducing the footprint of the project, siting infrastructure in previously disturbed locations with low habitat values, noise restrictions near leks during breeding season, and washing vehicles and equipment to reduce the spread of invasive species. Land use specific Site-Specific Consultation-Based Design Features are included in Appendix D [of the 2015	Action F-SSS-ACDM 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Final EIS]. A list of Site-Specific Consultation-Based Design Features for the project must be specified and agreed upon by the SETT and project proponent prior to the start of the project and will become part of the permit/ contract requirements issued for the project. The project proponent will be required to implement, maintain, and monitor the RDFs (consistent with applicable law) in good working order throughout the duration of the project.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-ACDM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 5: —	Action C-SSS-ACDM 5: —	Action D-SSS-ACDM 5: —	Action E-SSS-ACDM 5: ***Mitigate*** – Mitigation involves the successful restoration or enhancement of Greater Sage-Grouse habitat and is designed to offset the negative impacts caused by an anthropogenic disturbance. Mitigation will be required for all anthropogenic disturbances impacting Greater Sage-Grouse habitat within the SGMA. Mitigation requirements will be determined by the State's Conservation Credit System.	Action F-SSS-ACDM 5: —	
Action A-SSS-ACDM 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 6: —	Action C-SSS-ACDM 6: —	Action D-SSS-ACDM 6: —	Action E-SSS-ACDM 6: Through the Nevada Sagebrush Ecosystem Council, a Governor-appointed, broad spectrum stakeholder forum, the following will occur: • Review and approval of a process to coordinate development activities in the SGMA. • Provision of a forum for participation from industry, state and federal resource management agencies, and the general public. • Oversight of the Nevada	Action F-SSS-ACDM 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Conservation Credit System • Development, review and approval of region-wide policies - in a transparent, consistent process - that respond to sagebrush ecosystem threats. • Setting and clarifying policies and management criteria for the SGMA and establishment of well-defined decision thresholds for threat assessments and mitigation (regulatory process). • Revision of the SGMA through field verifications and recommendations from the Nevada Sagebrush Ecosystem Technical Team based on the best available science. • Establishment of policies for the identification and prioritization of landscape-scale enhancement, restoration, fuel reduction, and mitigation projects based upon ecological site potential, state and transition models, and		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				other data that will contribute to decision making informed by science to increase resiliency. • Secure and consolidated funding and the direction of major expenditures for Greater Sage-Grouse conservation. • Facilitation and the resolution of conflicts between industry, landowners, and resource agencies when there is disagreement regarding Greater Sage-Grouse management. • Receipt and approval of an annual report from the Nevada Sagebrush Ecosystem Technical Team that includes compiled and summarized data on development, enhancement, and restoration activities in the SGMA, Greater Sage-Grouse population trends, and Nevada Sagebrush Ecosystem Conservation Credit System (PMA-3) progress. The Nevada Sagebrush Ecosystem Council will submit the		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				annual report to the Governor, USFWS, BLM, Forest Service, local and tribal governments and the general public. • Development of standards and protocols to propose to the BLM and Forest Service in order to facilitate expedited NEPA review for restoration activities in the SGMA. • Encourage and facilitate land management education and training for all SGMA user groups.		
Action A-SSS-ACDM 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 7: —	Action C-SSS-ACDM 7: —	Action D-SSS-ACDM 7: —	Action E-SSS-ACDM 7: The Nevada Sagebrush Ecosystem Technical Team, a multidisciplinary team with representatives from the Nevada Department of Agriculture, the Nevada Department of Conservation and Natural Resources Divisions of Forestry and State Lands, and the NDOW will: • In accordance with the Nevada Sagebrush Ecosystem Council's policy, oversee administration and	Action F-SSS-ACDM 7:	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				operation of the Nevada Sagebrush Ecosystem Conservation Credit System (PMA-3). • Identify and prioritize landscape-scale enhancement, restoration, fuel reduction, and mitigation projects based upon ecological site potential, state and transition models, and other data that will contribute to decision making informed by science to increase rangeland resiliency prior to and following wildfire. • Foster and maintain collaborative processes with State, local and Federal agencies to expedite permitting. As deemed appropriate by the Nevada Sagebrush Ecosystem Council, decision-making will be extended to the Nevada Sagebrush Ecosystem Technical Team such that permitting will be expedited rather than extended by an added layer of bureaucracy. • Provide consultation for project proponents who		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				want to conduct activities in the SGMA to incorporate "avoid, minimize, and mitigate "practices into project designs. Project applicants will have the opportunity to conduct "ground-truthing" for the presence or absence of habitat. • Assist the BLM and Forest Service as appropriate to evaluate the cumulative effects of individual small projects (less than five acres) to avoid exceeding a tolerable level of disturbance in the SGMA and to determine if additional mitigation is required. • Acquire data to refine the habitat categories in the SGMA using best available science. • Solicit grants and private contributions for sagebrush ecosystem conservation and restoration projects. • Establish a repository to maintain the inventory of development and mitigation projects, population data, and monitoring results.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				• Compile and summarize data annually, and submit an annual progress report to the Nevada Sagebrush Ecosystem Council. • Conduct regular adaptive management evaluations to make management and policy recommendations to the Nevada Sagebrush Ecosystem Council. • Engage and coordinate activities with Local Area Working Groups through existing State Conservation Districts. Coordinate continued engagement of proven collaborative successes by charging LAWGs with responsibilities such as a) developing and implementing site-specific plans to accomplish enhancement and restoration projects on federal lands that are identified by the Nevada Sagebrush Ecosystem Council as areas of high importance to Greater Sage-Grouse ; b) updating SGMA maps; c) monitoring; d) identifying potential habitat enhancement and		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				restoration projects; and e) other tasks where local, site-specific expertise can provide added value.		
Action A-SSS-ACDM 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-ACDM 8: —	Action C-SSS-ACDM 8: —	Action D-SSS-ACDM 8: —	Action E-SSS-ACDM 8: —	Action F-SSS-ACDM 8: —	
Opportunities for Proactive Measures						
Action A-SSS-OPM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-OPM 1	Action C-SSS-OPM 1—	Action D-SSS-OPM 1: Identify seasonal habitat areas where an array of conservation actions can be completed to improve habitat conditions.	Action E-SSS-OPM 1: See Role of Sagebrush Ecosystem Technical Team (Action E-SSS-ACDM 7).	Action F-SSS-OPM 1: —	
Action A-SSS-OPM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-OPM 2: —	Action C-SSS-OPM 2: —	Action D-SSS-OPM 2: Consider the use of a Greater Sage-Grouse telemetry database to help prioritize habitat conservation actions.	Action E-SSS-OPM 2: See Role of Sagebrush Ecosystem Technical Team (Action E-SSS-ACDM 7). TMA-22.12: Satellite telemetry data shall be compiled and provided to the Nevada Sagebrush Ecosystem Technical Team for local plan revisions and updates, and coordinated statewide to determine seasonal habitats such as breeding, nesting, brood rearing; movement patterns; and survival rates.	Action F-SSS-OPM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-OPM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-OPM 3: —	Action C-SSS-OPM 3: —	Action D-SSS-OPM 3: Establish a protocol for incorporating new science and changes over time, to update and keep State-wide habitat maps current.	Action E-SSS-OPM 3: Establish a protocol for incorporating new science and changes over time, to update and keep state-wide habitat maps current.	Action F-SSS-OPM 3: —	
Action A-SSS-OPM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-OPM 4: —	Action C-SSS-OPM 4: —	Action D-SSS-OPM 4: Continue to consult with the NDOW for all development or habitat restoration proposals in PHMA and GHMA. Also, coordinate with the Nevada Sagebrush Ecosystem Council and the CDFW on projects proposed within sagebrush ecosystems.	Action E-SSS-OPM 4: See SETT Consultation (Action E-SSS-ACDM 1)	Action F-SSS-OPM 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SSS-OPM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SSS-OPM 5: —	Action C-SSS-OPM 5: —	Action D-SSS-OPM 5: Identify areas within GHMA where off-site mitigation should occur to ensure Greater Sage-Grouse habitat goals are met. When providing guidance to applicants, ensure project proponents that may be contributing to potential mitigation are aware of such areas.	Action E-SSS-OPM 5: Options for mitigation will be identified in the State's Strategic Action Plan. The State's Strategic Action Plan will identify prioritized areas on public and private lands to implement a landscape scale restoration effort. This will spatially identify where the primary threats to Greater Sage-Grouse habitat are located throughout the state and provide management guidance for how to ameliorate these based on local area conditions and ecological site descriptions. The prioritization includes efforts to use mitigation funding in areas where Greater Sage-Grouse will derive the most benefit, even if those areas are not adjacent to or in the vicinity of impacted populations. This Strategic Action Plan will be updated at least every 5 years to reflect improvements in understanding and technology for mitigation activities.	Action F-SSS-OPM 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Habitat Restoration/Vegetation Management						
Action A-VEG 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 1: —	Action C-VEG 1: —	Action D-VEG 1: In PHMA and GHMA, coordinate, plan, design, and implement vegetation treatments (e.g., juniper removal, fuels treatments, and green stripping) and associated effectiveness monitoring between Resources, Vegetation Management, Emergency Stabilization, and Burned Area Rehabilitation programs to: • Promote the maintenance of large intact sagebrush communities; • Limit the expansion or dominance of invasive species and noxious weeds, including conifers, cheatgrass and medusa head; • Maintain or improve soil site stability, hydrologic function, and biological integrity; and • Enhance the native plant community with appropriate shrub, grass, and forb composition identified in the applicable Ecological Site	Action E-VEG 1: Identify and prioritize landscape-scale enhancement, restoration, fuel reduction, and mitigation projects based upon ecological site potential, state and transition models, and other data that will contribute to decision making informed by science to increase rangeland resiliency prior to and following wildfire.	Action F-VEG 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			Description (ESD) where available.			
Action A-VEG 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 2: Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit Greater Sage-Grouse (Meinke et al. 2009). Prioritize restoration in seasonal habitats that are thought to be limiting Greater Sage-Grouse distribution and/or abundance.	Action C-VEG 2: Same as Alternative A.	Action D-VEG 2: Utilize BLM and Forest Service agency Greater Sage-Grouse habitat maps to prioritize habitat restoration projects (see Table 2-11 in section 2.8.5 of this Chapter) with emphasis in PHMA, and to connect seasonal ranges regardless of habitat designation. Habitat restoration would include but is not limited to: • Restoration of sagebrush canopy in areas within Greater Sage-Grouse nesting and brood-rearing habitat. • Re-establishment of perennial grasses and native forbs in areas within Greater Sage-Grouse nesting, early and late-brood rearing habitat. • Reduce or remove pinyon and/or juniper in areas to enhance seasonal range connectivity, improve security at leks, and to	Action E-VEG 2: Restore ecologically functioning sagebrush ecosystems in Greater Sage-Grouse habitat already compromised by invasion. Restoration may include revegetating sites with native plants cultivated locally or locally adapted, non-native plant species where appropriate. Control of invasive species must be accompanied by ecosystem restoration. • Ecological site descriptions and associated state and transition models will be used to identify target areas for resiliency enhancement and/ or restoration. Maintaining and/or enhancing resilience should be given top priority. In the Great Basin sagebrush-bunchgrass communities, invasion resistance and successional resilience following disturbance are functions of a healthy perennial bunchgrass component.	Action F-VEG 2: Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit Greater Sage-Grouse (Meinke et al. 2009). Prioritize restoration in seasonal habitats that are thought to be limiting Greater Sage-Grouse distribution and/or abundance and where factors causing degradation have already been addressed (e.g., changes in livestock management).	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			maintain sagebrush canopy and understory integrity in nesting and brood-rearing habitats. • Restoration of all Greater Sage-Grouse habitat objectives in areas affected by wildfire and the continuing cheat-grass fire cycle. • Priority would be on restoration areas that have not crossed an ecological threshold.	Therefore a combination of active and passive management will be required to ensure this functionality. Areas that are in an invaded state that will likely transition to an annual grass monoculture if a disturbance occurs and are located within or near Greater Sage-Grouse habitat should be prioritized for restoration efforts to increase resistance and resilience. TMA-7: Initiate landscape level treatments in the SGMA to reverse the effects of Pinyon and/or Juniper encroachment and restore healthy, resilient sagebrush ecosystems. (2012 Plan) TMA-7.1: Inventory and prioritize areas for treatment of Phase I and Phase II encroachment in the SGMA to restore habitat resiliency, reduce avian predator perches, and increase forb and grass cover. (2012 Plan)		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 3: Include Greater Sage-Grouse habitat parameters as defined by Connelly et al. (2000a), Hagen et al. (2007) or if available, state Greater Sage-Grouse plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within PHMA the highest restoration priority.	Action C-VEG 3: Same as Alternative A.	Action D-VEG 3: Incorporate Greater Sage-Grouse habitat objectives (as described in Table 2-11 in section 2.8.5 of this Chapter) in the design of habitat restoration projects in PHMA and GHMA.	Action E-VEG 3: Incorporate Greater Sage-Grouse habitat objectives as described in Table 2-2 in the design of habitat restoration projects in PHMA and GHMA.	Action F-VEG 3: Include Greater Sage-Grouse habitat objectives in habitat restoration. Make meeting these objectives within PHMA and GHMA the highest restoration priority.	
Action A-VEG 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 4: —	Action C-VEG 4: Composition, function, and structure of native vegetation communities will be consistent with the reference state of the appropriate ESD and will provide for healthy, resilient, and recovering Greater Sage-Grouse habitat components.	Action D-VEG 4: —	Action E-VEG 4: —	Action F-VEG 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 5: Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success (Richards et al. 1998). Where probability of success or adapted seed availability is low, nonnative seeds may be used as long as they support Greater Sage-Grouse habitat objectives (Pyke 2011).	Action C-VEG 5: Seed local native ecotypes in areas of more intensive disturbance.	Action D-VEG 5: In order to determine effectiveness of actions within PHMA and GHMA, encourage seeding and planting research and demonstration plots on public lands for restoration and conservation of key vegetation communities, including but not limited to low, gray, and black sagebrush, and riparian areas, with academia, Tribes, public agencies and approved private companies or individuals.	Action E-VEG 5: TMA-4.2: Continue the expansion of, and improvements to, the Nevada Division of Forestry Seedbank & Plant Material program in conjunction with Federal partners. Utilize Nevada Division of Forestry conservation camp crews for native seed collection and rehabilitation activities. Improve storage capabilities for native seed and desirable species that provide a competitive advantage over invasive species and improve storage capabilities to promote longevity of available seed.	Action F-VEG 5: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 6: —	Action B-VEG 6: —	Action C-VEG 6: —	Action D-VEG 6: Within PHMA and GHMA, prioritize and implement seeding and planting treatments in low sage communities that have been affected by wildfire. To the extent feasible or available, use local seed collected from intact stands or greenhouse cultivation. To increase seeding success, consider the use of specialized seed drills to ensure effective soil and seed contact.	Action E-VEG 6: TMA-4.2: Continue the expansion of, and improvements to, the Nevada Division of Forestry Seedbank & Plant Material program in conjunction with Federal partners. Utilize Nevada Division of Forestry conservation camp crews for native seed collection and rehabilitation activities. Improve storage capabilities for native seed and desirable species that provide a competitive advantage over invasive species and improve storage capabilities to promote longevity of available seed.	Action F-VEG 6: —	
Action A-VEG 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 7: Design post restoration management to ensure long-term persistence. This could include changes in livestock grazing management, wild horse and burro management, and travel management, to achieve and maintain the desired condition of the restoration effort that benefits Greater Sage-Grouse (Eiswerth and Shonkwiler 2006).	Action C-VEG 7: Same as Alternative A.	Action D-VEG 7: —	Action E-VEG 7: —	Action F-VEG 7: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 8: Consider potential changes in climate (Miller et al. 2011) when proposing restoration seedings when using native plants. Consider collection from the warmer component of the species current range when selecting native species (Kramer and Havens 2009).	Action C-VEG 8: Same as Alternative A.	Action D-VEG 8: Same as Alternative A.	Action E-VEG 8: —	Action F-VEG 8: Same as Alternative B.	
Action A-VEG 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 9: Restore native (or desirable) plants and create landscape patterns which most benefit Greater Sage-Grouse .	Action C-VEG 9: Exotic seedings will be rehabbed, interseeded, restored to recover sagebrush in areas to expand PHMA.	Action D-VEG 9: Same as Alternative A.	Action E-VEG 9: —	Action F-VEG 9: —	
Action A-VEG 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 10: Make re-establishment of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration efforts.	Action C-VEG 10: Same as Alternative A.	Action D-VEG 10: Same as Alternative A.	Action E-VEG 10: —	Action F-VEG 10:	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 11: In fire prone areas where sagebrush seed is required for Greater Sage-Grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production (Armstrong 2007) and are a priority for protection from outside disturbances.	Action C-VEG 11: Same as Alternative A.	Action D-VEG 11: —	Action E-VEG 11: —	Action F-VEG 11: Same as Alternative B.	
Action A-VEG 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 12: —	Action C-VEG 12: Active restoration practices: • Removal of livestock water troughs, pipelines, and wells. • Where possible, without further damage to springs/water sources, remove waterline piping and maximize water at spring/stream sources supporting diverse riparian and meadow vegetation. • Promote natural healing of headcuts to the maximum extent possible by	Action D-VEG 12: —	Action E-VEG 12: —	Action F-VEG 12: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
		limiting disturbance throughout the watershed. At times, a combination of methods may need to be used – but gabions and structural devises and boulder dumping should be limited, and restoration should strive for a functioning system. • Ripping/ recontouring of roads and seeding with native local ecotypes of shrubs and grasses.				

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 13: —	Action C-VEG 13: Active restoration of crested wheatgrass seedings. This can be accomplished, following targeted restoration planning to expand, reconnect or recover habitats required by Greater Sage-Grouse by: • Inter-seeding sagebrush seed or seedlings. • Remove crested wheatgrass through plowing while minimizing use of herbicides. Subsequent re-seeding with local native ecotypes. • Active restoration of cheatgrass infestation areas. In all cases, local native plant ecotype seeds and seedlings must be used.	Action D-VEG 13: —	Action E-VEG 13: —	Action F-VEG 13: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 14: —	Action C-VEG 14: —	Action D-VEG 14: —	Action E-VEG 14: —	Action F-VEG 14: Avoid sagebrush reduction/treatments to increase livestock or big game forage in PHMA and GHMA and include plans to restore high-quality habitat in areas with invasive species. (Audubon)	
Action A-VEG 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 15: —	Action C-VEG 15: —	Action D-VEG 15: No new roads (temporary or permanent) would be constructed or created during project implementation for vegetation treatments. Administrative access including off-road travel with heavy equipment and vehicles would occur during implementation. Loading and unloading of all equipment would occur on existing roads to minimize disturbance to vegetation and soil.	Action E-VEG 15: Allow temporary road access to vegetation treatment areas. Construct temporary access roads where access is needed with minimum design standards to avoid and minimize impacts. Remove and restore temporary roads upon completion of treatment. (2012 Plan)	Action F-VEG 15: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 16: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 16: —	Action C-VEG 16: —	Action D-VEG 16: Within PHMA and GHMA, when closing and reseeding roads, primitive roads, and trails not designated in travel management plans, evaluate the location for strategic protection of the overall habitat and consider using fire resistant species to provide for fire break on a case-by-case basis.	Action E-VEG 16: Conduct rehabilitation of roads, primitive roads, and trails not designated in travel management plans where such plans exist and have been approved for implementation. This also includes primitive route/roads that were not designated in wilderness study areas and within lands managed for wilderness characteristics that have been selected for protection, with due consideration given to any historical significance of existing trails. When reseeding roads, primitive roads, and trails, use appropriate seed mixes and consider the use of transplanted sagebrush in order to meet Greater Sage-Grouse habitat restoration objectives. Where invasive annual grasses are present, herbicides may be used to enhance the effectiveness of any seeding and to also establish islands of desirable species for dispersion. (See Appendix D [of the 2015 Final EIS]).	Action F-VEG 16: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 17: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 17:	Action C-VEG 17	Action D-VEG 17: Evaluate vegetation treatments (including Greater Sage-Grouse habitat treatments) in a landscape-scale context to address habitat fragmentation, effective patch size, invasive species presence, and protection of intact sagebrush communities. Coordinate vegetation treatments with adjacent land owners and agencies to avoid any unintended negative landscape effects on Greater Sage-Grouse .	Action E-VEG 17: —	Action F-VEG 17: —	
Action A-VEG 18: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 18: —	Action C-VEG 18: —	Action D-VEG 18: Establish restoration areas where reseeding can be applied to improve impaired Greater Sage-Grouse habitat.	Action E-VEG 18: See role of Sagebrush Ecosystem Technical Team (Action E-SSS-ACDM 7).	Action F-VEG 18: —	
Action A-VEG 19: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 19: —	Action C-VEG 19: —	Action D-VEG 19: In PHMA and GHMA, rest allotments or pastures for one growing season year prior to initiating vegetation treatments, as needed, to increase resiliency of vegetation communities prior to treatment, unless grazing is part of the vegetation treatment design.	Action E-VEG 19: See role of Sagebrush Ecosystem Technical Team.	Action F-VEG 19: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 20: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 20: —	Action C-VEG 20: —	Action D-VEG 20: In PHMA and GHMA, rest treated areas from livestock grazing for a minimum of two full growing seasons following treatment or until vegetation or habitat objectives are met.	Action E-VEG 20: —	Action F-VEG 20: —	
Action A-VEG 21: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 21: —	Action C-VEG 21: —	Action D-VEG 21: In PHMA and GHMA, monitor and control noxious weeds and invasive annual grasses post-treatment to meet and sustain Greater Sage-Grouse habitat and vegetation objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Action E-VEG 21: In the Core, Priority, and General Management areas, monitor and control noxious weeds and invasive annual grasses post-treatment to meet and sustain Greater Sage-Grouse habitat and vegetation objectives (see Table 2-2).	Action F-VEG 21: —	
Action A-VEG 22: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 22: —	Action C-VEG 22: —	Action D-VEG 22: Where winter range has been identified as a limiting factor, emphasize vegetation treatments in known winter range to enhance habitat quality or reduce wildfire risk around or within winter range habitat.	Action E-VEG 22: —	Action F-VEG 22: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 23: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 23: —	Action C-VEG 23: —	Action D-VEG 23: Manage lotic riparian habitats in conjunction with adjacent terraces and/or valley bottoms as natural fuel breaks to reduce size and frequency of wildfires in PHMA and GHMA.	Action E-VEG 23: —	Action F-VEG 23: —	
Action A-VEG 24: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 24: —	Action C-VEG 24: —	Action D-VEG 24: In lentic and lotic riparian systems, conserve or enhance these systems to maintain or increase amount of edge and cover.	Action E-VEG 24: —	Action F-VEG 24: —	
Action A-VEG 25: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 25: —	Action C-VEG 25: —	Action D-VEG 25: In PHMA and GHMA, in riparian and wet meadows, inventory, monitor for, and control invasive species. When treating invasive species, use the standard operating procedures and BMPs[2] outlined in the 2007 Vegetation Treatments Using Herbicides on BLM Lands in 17 States EIS and ROD, and for the Forest Service administered lands adhere to the Humboldt-Toiyabe Forest Directive for Herbicide Application and applicable practices found in its	Action E-VEG 25: 1. ***Prevent*** the establishment of invasive species into uninvaded Greater Sage-Grouse habitat. This will be achieved by conducting systematic and strategic detection surveys, data collection, and mapping of these areas and engaging in early response efforts if invasion occurs. This will be achieved by further developing federal and state partnerships and working with local groups, such as Weed Control Districts, Cooperative Weed Management Areas, and Conservation	Action F-VEG 25: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			accompanying Biological Assessment.	Districts. This is the highest priority for the state of Nevada. 2. ***Control*** invasive species infestations in Greater Sage-Grouse habitat already compromised by invasion. Control techniques may include: biomass removal by means such as strategic and targeted grazing, mowing, or using herbicides. In addition, the state will continue to support research in the development of biological control agents and deploy emerging technologies in Nevada as they become available. 3. ***Restore*** ecologically functioning sagebrush ecosystems in Greater Sage-Grouse habitat already compromised by invasion. Restoration may include revegetating sites with native plants cultivated locally or locally adapted, non-native plant species where appropriate. Control of invasive species must be accompanied by ecosystem restoration. a. Ecological site descriptions and		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				associated state and transition models will be used to identify target areas for resiliency enhancement and/ or restoration. Maintaining and/or enhancing resilience should be given top priority. In the Great Basin sagebrush-bunchgrass communities, invasion resistance and successional resilience following disturbance are functions of a healthy perennial bunchgrass component. Therefore a combination of active and passive management will be required to ensure this functionality. Areas that are in an invaded state that will likely transition to an annual grass monoculture if a disturbance occurs and are located within or near Greater Sage-Grouse habitat should be prioritized for restoration efforts to increase resistance and resilience. 4. ***Monitor*** and adaptively manage to ensure effectiveness of efforts to prevent, control and restore.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 26: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 26: —	Action C-VEG 26: —	Action D-VEG 26: In PHMA and GHMA, design water developments to maintain ecological integrity of lentic riparian habitats. See management actions in the Range section.	Action E-VEG 26: Implement Site-Specific Consultation Based Design Features as appropriate. See Appendix D [of the 2015 Final EIS].	Action F-VEG 26: —	
Action A-VEG 27: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 27: —	Action C-VEG 27: —	Action D-VEG 27: In PHMA and GHMA, design and implement vegetation treatments to restore, enhance, and maintain riparian areas to meet seasonal life history requirements (e.g. late summer brood rearing habitat) for Greater Sage-Grouse .	Action E-VEG 27: —	Action F-VEG 27: —	
Action A-VEG 28: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 28: —	Action C-VEG 28: —	Action D-VEG 28: In PHMA and GHMA, where riparian extent is limited by shrub encroachment consider fuels treatments including prescribed burning or other means to increase edge and expand mesic areas to improve late summer brood-rearing habitat (see Table 2-11 in section 2.8.5 of this Chapter).	Action E-VEG 28: —	Action F-VEG 28: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 29: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 29: —	Action C-VEG 29: —	Action D-VEG 29: For Wyoming, Mountain, and Basin Big Sage Communities in PHMA and GHMA: • Priority for treatment would focus on enhancing, reestablishing or maintaining the most limiting habitat component. • Reestablish sagebrush to meet habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter). • Manipulate sagebrush communities to achieve age-class, structure, cover, and species composition objectives in Greater Sage-Grouse habitat (see Table 2-11 in section 2.8.5 of this Chapter). • Restore herbaceous understory in brush dominated areas to meet habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter). • Establish and maintain fuel breaks to limit fire size and mitigate fire behavior to increase	Action E-VEG 29: —	Action F-VEG 29: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			suppression effectiveness. When possible, establish fuel breaks adjacent to roads or other previously disturbed areas. • Treat areas with cheatgrass, other invasive and noxious species presence to minimize competition and favor establishment of desired species. • Treat disturbed areas as soon as possible but within one year of the disturbance. • Select the appropriate treatment method(s) that meets the vegetative objective per the decisions identified in the Vegetation Treatments on BLM Lands in 17 Western States Programmatic EIS and Associated ROD (BLM 2007a).			

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 30: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 30: —	Action C-VEG 30: —	Action D-VEG 30: Where pinyon and/or juniper trees are encroaching on sagebrush plant communities, design treatments to decrease conifer encroachment, and increase cover of sagebrush and/or understory to (1) improve habitat for Greater Sage-Grouse ; and (2) minimize avian predator perches and predation opportunities on Greater Sage-Grouse .	Action E-VEG 30: TMA-7: Initiate landscape level treatments in the SGMA to reverse the effects of Pinyon and/or Juniper encroachment and restore healthy, resilient sagebrush ecosystems.	Action F-VEG 30: —	
Action A-VEG 31: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 31: —	Action C-VEG 31: —	Action D-VEG 31: For Low Sage/Black Sage Communities monitor and treat cheatgrass and other invasive species in low sage vegetation communities in PHMA and GHMA before it becomes a dominant species.	Action E-VEG 31: —	Action F-VEG 31: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG 32: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG 32: —	Action C-VEG 32: —	Action D-VEG 32: For existing nonnative seeding: Allow natural establishment of sagebrush to occur in nonnative seedings within or adjacent to Greater Sage-Grouse habitat. Manage seedings to allow succession toward sagebrush canopy cover more favorable for Greater Sage-Grouse nesting and early brood-rearing needs.	Action E-VEG 32: —	Action F-VEG 32: —	
Integrated Invasive Species Management						
Action A-VEG-ISM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISM 1: —	Action C-VEG-ISM 1: —	Action D-VEG-ISM 1: Assess invasive annual grass presence/distribution prior to implementing vegetation restoration projects to determine if additional treatments are required to treat invasive annual grasses. Prioritize treatments to remove invasive annual grasses to provide most benefit to Greater Sage-Grouse habitat conditions.	Action E-VEG ISM 1: See Action E-VEG 25 – Prevent, Control, Restore, and Monitor.	Action F-VEG-ISM 1: In Greater Sage-Grouse habitat, ensure that soil cover and native herbaceous plants are at their ESD potential to help protect against invasive plants. In areas without ESDs, reference sites would be utilized to identify appropriate vegetation communities and soil cover.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Additional Management - Invasive Species and Conifer Encroachment						
Action A-VEG-ISCE 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 1: —	Action C-VEG- ISCE 1: —	Action D-VEG- ISCE 1: Treat sites within PHMA and GHMA that are dominated by invasive species through an IVM approach using fire, chemical, mechanical and biological methods based on site potential.	Action E-VEG- ISCE 1: TMA-6.1: Continue Nevada Department of Agriculture statewide surveys for the detection of incipient invasive and noxious plants in conjunction with USDA-APHIS and the Nevada Department of Transportation. • Conducts and attends numerous workshops, field days, booth and other events to promote education, awareness, and outreach to limit introduction and spread of invasive and noxious plants on public lands and natural habitat. Statewide CWMAs support program: • Provide technical assistance, project success monitoring and financial support to CWMAs through federal and state funding for projects performing the following tasks: • Noxious weed and invasive plant treatments on lands	Action F-VEG- ISCE 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				degraded by infestations. • Early Detection, Rapid Response (EDRR) surveying for new noxious weed species that are not already established in the state and pose new threats to healthy native plant ecosystems. • Native planting and reseeding on previously treated sites or in areas susceptible to invasion in order to improve habitat and/or the overall health of lands. • Educational activities directed toward local communities regarding the negative impacts of noxious weeds and the importance of infestation spread prevention and the implementation of integrated weed management plans. • Provide technical assistance, project success monitoring and financial support to areas across the state that were previously burned and currently threatened by fires due to noxious weed infestations and/or fire		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				fuels. Nonfederal land tasks include: o Fuels reduction through noxious weed decadent material removal, noxious weed and invasive plant treatments, and other forested and riparian area fire fuel load thinning. o Native planting and reseeding in cleared areas and degraded riparian habitat areas. o Private landowner assistance in fire and invasive plant invasion prevention and land management plans.		
Action A-VEG-ISCE 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 2: —	Action C-VEG-ISCE 2: —	Action D-VEG-ISCE 2: Targeted early season grazing would be allowed to suppress cheatgrass (*Bromus tectorum*) or other vegetation that are hindering achieving Greater Sage-Grouse objectives in PHMA and GHMA. Sheep, cattle, or goats (where permitted) may be used as long as the animals are intensely managed and removed when the utilization of desirable species reaches 35%.	Action E-VEG-ISCE 2: TMA-12.1: Expand the promotion of proper livestock grazing practices that promote the health of perennial grass communities as this condition has been found to suppress the establishment of cheatgrass	Action F-VEG-ISCE 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-ISCE 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 3: —	Action C-VEG-ISCE 3: —	Action D-VEG-ISCE 3: In perennial grass, invasive annual grass, and conifer-invaded cover types, restore sagebrush steppe with sagebrush seedings where feasible.	Action E-VEG-ISCE 3: See Role of Sagebrush Ecosystem Technical Team (Action E-SSS-ACDM 5).	Action F-VEG-ISCE 3: —	
Action A-VEG-ISCE 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 4: —	Action C-VEG-ISCE 4: —	Action D-VEG-ISCE 4: Pinyon and/or juniper treatment in PHMA and GHMA would focus on enhancing, reestablishing, or maintaining habitat components (e.g. cover, security, and food) in order to achieve habitat objectives identified in Table 2-11 in section 2.8.5 of this Chapter. Treatment design should focus on addressing the most limiting habitat component.	Action E-VEG-ISCE 4: TMA-7: Initiate landscape level treatments in the SGMA to reverse the effects of Pinyon and/or Juniper encroachment and restore healthy, resilient sagebrush ecosystems. TMA-7.5: Allocate sufficient resources to fully address habitat loss and degradation in the next ten years.	Action F-VEG-ISCE 4: —	
Action A-VEG-ISCE 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 5: —	Action C-VEG-ISCE 5: —	Action D-VEG-ISCE 5: —	Action E-VEG-ISCE 5: Inventory and prioritize areas for treatment of Phase I and Phase II encroachment in the SGMA to restore habitat resiliency, reduce avian predator perches, and increase forb and grass cover.	Action F-VEG-ISCE 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-ISCE 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 6: —	Action C-VEG-ISCE 6: —	Action D-VEG-ISCE 6: —	Action E-VEG-ISCE 6: Aggressively implement plans to remove Phase I and Phase II encroachment and treat Phase III encroachment to reduce the threat of severe conflagration and restore the SGMA where possible, especially in areas in close proximity to Occupied and Suitable Habitat.	Action F-VEG-ISCE 6: —	
Action A-VEG-ISCE 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 7: —	Action C-VEG-ISCE 7: —	Action D-VEG-ISCE 7: Manage pinyon and/or juniper stands in encroached sagebrush vegetation communities to meet Greater Sage-Grouse habitat objectives as described in Table 2-11 in section 2.8.5 of this Chapter. In areas with a sagebrush component, select treatment methods that maintain sagebrush and shrub cover and composition.	Action E-VEG-ISCE 7: TMA-7.1: Inventory and prioritize areas for treatment of Phase I and Phase II encroachment in the SGMA to restore habitat resiliency, reduce avian predator perches, and increase forb and grass cover.	Action F-VEG-ISCE 7: —	
Action A-VEG-ISCE 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 8: —	Action C-VEG-ISCE 8: —	Action D-VEG-ISCE 8: In Phase II and III pinyon and/or juniper stands in PHMA and GHMA: • Remove or reduce biomass to meet fuel and Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of	Action E-VEG-ISCE 8: TMA-7.2: Aggressively implement plans to remove Phase I and Phase II encroachment and treat Phase III encroachment to reduce the threat of severe conflagration and restore the SGMA where possible, especially in areas	Action F-VEG-ISCE 8: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			this Chapter). • Take appropriate action to establish desired understory species composition, including seeding and invasive species treatments. • In areas with a sagebrush component, select a treatment method that maintains or improves sagebrush and shrub cover and composition.	in close proximity to Core and Priority Management Areas (State of Nevada 2012). TMA-7.3: Prioritize areas for treatment of Phase III Pinyon and/or Juniper encroachment in strategic areas to break up continuous, hazardous fuel beds. Treat areas that have the greatest opportunity for recovery in the SGMA based on ecological site potential. Old growth trees should be protected on woodland sites (State of Nevada 2012). TMA-7.4: Allow temporary road access to Phase I, Phase II, and Phase III treatment areas. Construct temporary access roads where access is needed with minimum design standards to avoid and minimize impacts. Remove and restore temporary roads upon completion of treatment.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-ISCE 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 9: —	Action C-VEG-ISCE 9: —	Action D-VEG-ISCE 9: —	Action E-VEG-ISCE 9: Allow temporary road access to Phase I, Phase II, and Phase III treatment areas. Construct temporary access roads where access is needed with minimum design standards to avoid and minimize impacts. Remove and restore temporary roads upon completion of treatment.	Action F-VEG-ISCE 9: —	
Action A-VEG-ISCE 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 10: —	Action C-VEG-ISCE 10: —	Action D-VEG-ISCE 10: —	Action E-VEG-ISCE 10: Allocate sufficient resources to fully address habitat loss and degradation in the next ten years.	Action F-VEG-ISCE 10: —	
Action A-VEG-ISCE 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 11: —	Action C-VEG-ISCE 11: —	Action D-VEG-ISCE 11: —	Action E-VEG-ISCE 11: TMA-7.7: Continue to incentivize and assist in the development of bio-fuels and other commercial uses of Pinyon and/or Juniper resources.	Action F-VEG-ISCE 11: —	
Action A-VEG-ISCE 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 12: —	Action C-VEG-ISCE 12: —	Action D-VEG-ISCE 12: —	Action E-VEG-ISCE 12: TMA-7.8: Increase the incentives for private industry investment in biomass removal, land restoration, and renewable energy development by authorizing stewardship contracts for up to 20 years.	Action F-VEG-ISCE 12: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-ISCE 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 13: —	Action C-VEG-ISCE 13: —	Action D-VEG-ISCE 13: —	Action E-VEG-ISCE 13: TMA-7.9: The Nevada Sagebrush Ecosystem Council will establish a goal for the number of acres to be treated annually and work to accomplish that goal over time.	Action F-VEG-ISCE 13: —	
Action A-VEG-ISCE 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-ISCE 14: —	Action C-VEG-ISCE 14: —	Action D-VEG-ISCE 14: —	Action E-VEG-ISCE 14: Maintain a mosaic of shrub cover conditions ranging from twenty percent to forty percent in nesting habitat to provide both habitat resiliency and preferred nesting conditions for Greater Sage-Grouse in areas with high raven populations. Where this amount of shrub cover is not available (<25%), then perennial grass cover should exceed 10% (Coates et al. 2011) and annual grass cover should not exceed 5% (Blomberg et al. 2012).	Action F-VEG-ISCE 14: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Habitat conservation for agriculture						
Action A-VEG-HCA 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-HCA 1: —	Action C-VEG-HCA 1: —	Action D-VEG-HCA 1: —	Action E-VEG-HCA 1: TMA-10: Implement a best practices certification program for ranch management and forage production in consultation with the US Department of Agriculture, Natural Resource Conservation Service, and the Nevada Department of Agriculture.	Action F-VEG-HCA 1: —	
Climate Change						
Action A-VEG-CC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 1: —	Action C-VEG-CC 1: —	Action D-VEG-CC 1: As climate change data become available through REAs or other ecological studies, identify areas of unfragmented Greater Sage-Grouse habitat and key habitat linkages that provide the life-cycle and genetic transfer needs for Greater Sage-Grouse .	Action E-VEG-CC 1: —	Action F-VEG-CC 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-CC 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 2: —	Action C-VEG-CC 2: —	Action D-VEG-CC 2: Implement prevention and suppression actions to prevent additional loss to wildlife and cheatgrass domination in areas that are progressing towards recovery to build resiliency to climate change. Also, implement various treatments, such as seeding and shrub plantings, to restore Greater Sage-Grouse habitat.	Action E-VEG-CC 2: —	Action F-VEG-CC 2: —	
Action A-VEG-CC 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 3: —	Action C-VEG-CC 3: —	Action D-VEG-CC 3: Implement juniper removal treatments in areas with high potential to restore Greater Sage-Grouse habitat. Priority for treatments area: Highest Priority - Phase 2 Pinyon and/or Juniper Stands to prevent long-term loss of Greater Sage-Grouse habitat due to the area crossing a restoration threshold. Second Priority – Phase 1 Pinyon and/or Juniper stands to prevent the spread of the woodlands into Greater Sage-Grouse habitat.	Action E-VEG-CC 3: TMA-7: Initiate landscape level treatments in the SGMA to reverse the effects of Pinyon and/or Juniper encroachment and restore healthy, resilient sagebrush ecosystems. (2012 Plan) TMA-7.1: Inventory and prioritize areas for treatment of Phase I and Phase II encroachment in the SGMA to restore habitat resiliency, reduce avian predator perches, and increase forb and grass cover. (2012 Plan) TMA-7.2: Aggressively implement plans to remove Phase I and Phase II encroachment and treat	Action F-VEG-CC 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Phase III encroachment to reduce the threat of severe conflagration and restore SGMAs where possible, especially in areas in close proximity to Occupied and Suitable Habitat. (2012 Plan) TMA-7.3: Prioritize areas for treatment of Phase III Pinyon and/or Juniper encroachment in strategic areas to break up continuous, hazardous fuel beds. Treat areas that have the greatest opportunity for recovery in the SGMA based on ecological site potential. Old growth trees should be protected on woodland sites. (2012 Plan)		
Action A-VEG-CC 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 4: —	Action C-VEG-CC 4: —	Action D-VEG-CC 4: Implement treatments to reduce the presence of cheatgrass and restore sagebrush and native forbs and grasses in fragmented habitat with high potential for success. Also implement fuel treatments to protect these areas for wildlife.	Action E-VEG-CC 4: Restore ecologically functioning sagebrush ecosystems in Greater Sage-Grouse habitat already compromised by invasion. Restoration may include revegetating sites with native plants cultivated locally or locally adapted, non-native plant species where appropriate. Control of invasive species must be accompanied by ecosystem restoration.	Action F-VEG-CC 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-CC 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 5: —	Action C-VEG-CC 5: —	Action D-VEG-CC 5: Implement hazardous fuels, noxious weed, and cheatgrass treatments as well as adjusting uses to protect native vegetation communities that provide high quality Greater Sage-Grouse habitat. Priorities for treatments are: Highest priority – Areas of high quality habitat where forecasted bioclimatic conditions are predicted to persist through at least 2050. Second Priority – Areas of high to moderate value for Greater Sage-Grouse habitat in lower elevations that are susceptible to cheatgrass domination and less likely to recover naturally from disturbance. Third Priority – Areas of high to moderate value for Greater Sage-Grouse in higher elevations as that are more resistant to cheatgrass domination and more likely to recover naturally from disturbance.	Action E-VEG-CC 5: —	Action F-VEG-CC 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-CC 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 6: —	Action C-VEG-CC 6: —	Action D-VEG-CC 6: Build resiliency into restoration and enhancement seed mixes to ensure high value habitat persistence in light of anticipated climate change effects.	Action D-VEG-CC 6: Ecological site descriptions and associated state and transition models will be used to identify target areas for resiliency enhancement and/ or restoration. Maintaining and/or enhancing resilience should be given top priority. In the Great Basin sagebrush-bunchgrass communities, invasion resistance and successional resilience following disturbance are functions of a healthy perennial bunchgrass component. Therefore a combination of active and passive management will be required to ensure this functionality. Areas that are in an invaded state that will likely transition to an annual grass monoculture if a disturbance occurs and are located within or near Greater Sage-Grouse habitat should be prioritized for restoration efforts to increase resistance and resilience.	Action F-VEG-CC 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-CC 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-CC 7: —	Action C-VEG-CC 7: —	Action D-VEG-CC 7: Work cooperatively with multiple agencies and stakeholders to establish and maintain a network of climate monitoring sites and stations.	Action E-VEG-CC 7: —	Action F-VEG-CC 7: —	
Drought						
Action A-VEG-D 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-D 1: During drought periods, prioritize evaluating effects of the drought in PHMA relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets Greater Sage-Grouse needs in PHMA.	Action C-VEG-D 1: —	Action D-VEG-D 1: —	Action E-VEG-D 1: —	Action F-VEG-D 1: During drought periods, prioritize evaluating effects of drought in Greater Sage-Grouse habitat areas relative to their biological needs, as well as drought effects on ungrazed reference areas. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets Greater Sage-Grouse needs in Greater Sage-Grouse habitat areas based on Greater Sage-Grouse habitat objectives.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-VEG-D 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-D 2: —	Action C-VEG-D 2: —	Action D-VEG-D 2: In sagebrush ecosystems containing PHMA and GHMA, follow guidance in the Resource Management During Drought Handbook H-1730-1 (BLM 2011c). Apply appropriate drought mitigation measures to authorized uses and activities to reduce impacts on Greater Sage-Grouse habitat and populations.	Action E-VEG-D 2: —	Action F-VEG-D 2: —	
Action A-VEG-D 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-VEG-D 3: —	Action C-VEG-D 3: —	Action D-VEG-D 3: Initiate emergency management measures during times of drought to protect Greater Sage-Grouse PHMA and GHMA. Implement post-drought management to allow for vegetation recovery that meets Greater Sage-Grouse life cycle needs in PHMA and GHMA.	Action E-VEG-D 3: —	Action F-VEG-D 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F
Wild Horses and Burros					
Action A-WHB 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB 1: —	Action C-WHB 1: —	Action D-WHB 1: For all HMAs, HAs and WHBTs within or that contain PHMA and GHMA, manage wild horse and burro populations within established AML to meet Greater Sage-Grouse habitat objectives. In HMAs, HAs, and WHBTs not meeting standards due to degradation that can be at least partially contributed to wild horse or burro populations, consider adjustments to AML through the NEPA process. Adjustments would be based on monitoring data and would seek to protect and enhance PHMA and GHMA and establish a thriving ecological balance.	Action E-WHB 1: Even if current AML is not being exceeded, yet habitat within the SGMA continues to become degraded, at least partially due to wild horses or burros, established AMLs within the HMA or WHBT should be reduced through the NEPA process and monitored annually to help determine future management decisions. Unless already meeting the lowest established AML level, during periods of drought, AMLs should be reduced to a level that is consistent with maintaining Greater Sage-Grouse habitat objectives (see Table 2-2).	Action F-WHB 1: Reduce AMLs within HMAs and reduce WHBTs within occupied Greater Sage-Grouse habitat by 25% to meet habitat objectives. —

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB 2: Within PHMA, develop or amend BLM Herd Management Area Plans (HMAPs) and Forest Service WHBT Plans to incorporate Greater Sage-Grouse habitat objectives and management considerations for all BLM HMAs and Forest Service WHBTs.	Action C-WHB 2: Same as Alternative A.	Action D-WHB 2: —	Action E-WHB 2: Ensure that Herd Management Area Plans (HMAP) and WHBT plans are developed and/or amended within the Core, Priority, and General management areas, identified in the State's management areas map, taking into consideration the Greater Sage-Grouse habitat objectives (see Table 2-2).	Action F-WHB 2: Same as Alternative B, except reduce AMLs within HMAs and reduce WHBTs within occupied Greater Sage-Grouse habitat by 25% to meet habitat objectives.	
Action A-WHB 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB 3: For all BLM HMAs and Forest Service WHBTs within PHMA, prioritize the evaluation of all AMLs based on indicators that address structure/condition/composition of vegetation and measurements specific to achieving Greater Sage-Grouse habitat objectives.	Action C-WHB 3: Same as Alternative A.	Action D-WHB 3: —	Action E-WHB 3: Methods that were used to initially establish AMLs should be reevaluated to determine if they are still sufficient to achieve Greater Sage-Grouse habitat objectives (see Table 2-2).	Action F-WHB 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB 4: Coordinate with other resources (Range, Wildlife, and Riparian) to conduct land health assessments to determine existing structure/condition/composition of vegetation within all BLM HMAs and Forest Service WHBTs.	Action C-WHB 4: Same as Alternative A.	Action D-WHB 4: —	Action E-WHB 4: Use professionals (e.g., botanists, rangeland ecologists, wildlife biologists, and hydrologists) from diverse backgrounds to conduct land health assessments, proper functioning condition, site-specific wild horse and burro grazing response indices assessments, and habitat objective assessments.	Action F-WHB 4: Same as Alternative B.	
Action A-WHB 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB 5: When conducting NEPA analysis for wild horse and burro management activities, water developments or other rangeland improvements for wild horses in PHMA, address the direct and indirect effects on Greater Sage-Grouse populations and habitat. Implement any water developments or rangeland improvements using the criteria identified for domestic livestock identified above in PHMA.	Action C-WHB 5: Same as Alternative A.	Action D-WHB 5: —	Action E-WHB 5: When implementing management activities, water developments, or rangeland improvements for wild horses or burros, consider both direct and indirect effects on Greater Sage-Grouse and use the applicable Site-Specific Consultation Based Design Features (SSCBDF) (see Appendix D [of the 2015 Final EIS]) to minimize potential impacts or disturbances.	Action F-WHB 5: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 6: —	Action B-WHB 6: —	Action C-WHB 6: —	Action D-WHB 6: —	Action E-WHB 6: Given their capability to increase their numbers by 18%-25% annually, resulting in the doubling in population every 4-5 years (Wolfe et al. 1989; Garrott et al. 1991), wild horse gathers should be conducted to attain the lowest levels of AML. This in combination with continued and expanded use and development of effective forms of population growth suppression techniques will enable AML to be maintained for longer periods and reduce the frequency of gathers and associated cost and effort.	Action F-WHB 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 7: —	Action B-WHB 7: —	Action C-WHB 7: —	Action D-WHB 7: —	Action E-WHB 7: In order to expedite recovery time and enhance restoration efforts following wildfire or Greater Sage-Grouse habitat enhancement projects , consider a significant reduction and temporary removal or exclusion of all wild horses and burros within or from burned areas where HMAs and WHBT overlap with Greater Sage-Grouse Core, Priority, and General Management Areas. Wild horse grazing behaviors and specialized physiological requirements make unmanaged grazing on recently burned/ treated areas problematic for reestablishment of burned and/or seeded vegetation. (Arnold and Dudzinski 1978; Rittenhouse et al. 1982; Duncan et al. 1990; Hanley 1982; Wagner 1983; Menard et al. 2002; Stoddart et al. 1975; Symanski1994).	Action F-WHB 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 8: —	Action B-WHB 8: —	Action C-WHB 8: —	Action D-WHB 8: —	Action E-WHB 8: If current AML is being exceeded, consider emergency short-term measures to reduce or avoid degradation of Greater Sage-Grouse habitat from HMAs or WHBT that are in excess of established AML levels within the SGMA.	Action F-WHB 8: —	
Action A-WHB 9: —	Action B-WHB 9: —	Action C-WHB 9: —	Action D-WHB 9: —	Action E-WHB 9: If monitored sites are not meeting Greater Sage-Grouse habitat objectives in Table 2-2, even if AML is being met, and it is determined that wild horses or burros are the primary causal factor, then implement protective measures as applicable in addressing similar emergencies (e.g. fire, flood, and drought). Consider exclusionary fencing of riparian or other mesic sites and implement water developments (following the SSCBDF as described in Appendix D [of the 2015 Final EIS]) to ensure dispersal or avoidance of sites heavily impacted by wild horses (Feist 1971; Pellegrini 1971; Ganskopp	Action F-WHB 9: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				and Vavra 1986; Naiman et al. 1992). A water source that meets the SSCBDF should be provided, as horses traditionally do not leave known water sources just because they are fenced. Plan for and implement an immediate reduction in herd size to a level that would enable the area to recover to trend toward meeting the habitat objectives in Table 2-2 and to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area. Consider lowering the AML levels to prevent future damage.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-WHB 10: —	Action B-WHB 10: —	Action C-WHB 10: —	Action D-WHB 10: —	Action E-WHB 10: Implement a telemetry monitoring program for wild horses. Research regarding the direct interactions between, and in indirect effects of wild horses and Greater Sage-Grouse is identified as a need and could further assist the agencies in the development of habitat selection maps (Beever and Aldridge et al. 2011) as well as offer a general understanding of the intensity, timing, and duration of use by wild horses within the SGMA.	Action F-WHB 10: —	
Action A-WHB 11: —	Action B-WHB 11: —	Action C-WHB 11: —	Action D-WHB 11: —	Action E-WHB 11: Work with professionals from other federal and state agencies, researchers at universities, and others to continue to develop, expand, and test more effective population growth suppression techniques, including contraception options	Action F-WHB 11: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Climate Change						
Action A-WHB-CC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB-CC 1: —	Action C-WHB-CC 1: —	Action D-WHB-CC 1: As climate change data become available through REAs or other ecological studies, identify areas of unfragmented Greater Sage-Grouse habitat and key habitat linkages that provide the life-cycle and genetic transfer needs for Greater Sage-Grouse . Manage the identified areas as PHMA.	Action E-WHB-CC 1: As climate data becomes available, adjust wild horse and burro and rangeland management practices to allow for Core, Priority, and General Management Areas to sustain or increase their sagebrush ecosystem resiliency and resistance.	Action F-WHB-CC 1: —	
Action A-WHB-CC 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-WHB-CC 2: —	Action C-WHB-CC 2: —	Action D-WHB-CC 2: Work cooperatively with multiple agencies and stakeholders to establish and maintain a network of climate monitoring sites and stations.	Action E-WHB-CC2: Collaborate with weather and climate professionals and agencies (e.g., UNR, DRI, and NOAA) to proactively manage the rangelands resources and adjust, as necessary, the current wild horse and burro management policies. Ensure that sufficient ongoing public and political education is provided.	Action F-WHB-CC 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Fire Management						
Action A-FFM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 1: —	Action C-FFM 1: —	Action D-FFM 1: —	Action E-FFM 1: Continue the expansion and implementation of a framework across all land jurisdictions for pre-suppression actions to minimize ignitions and alter fuel conditions in order to avoid, whenever possible, large damaging conflagrations.	Action F-FFM 1: —	
Action A-FFM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 2: —	Action A-FFM 2: —	Action D-FFM 2: —	Action E-FFM 2: Actively manage habitat within the SGMA across all jurisdictions with the goal of restoring the appropriate role of wildfire to establish resiliency, and actively engage in prevention, suppression and restoration of the effects of fire and invasive species.	Action F-FFM 2: —	
Action A-FFM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 3: —	Action C-FFM 3: —	Action D-FFM 3: —	Action E-FFM 3: Continue the expansion and implementation of fire suppression plans and strategies across all land jurisdictions within the SGMA.	Action F-FFM 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 4: —	Action C-FFM 4: —	Action D-FFM 4: Implement a coordinated inter-agency approach to fire restrictions based upon National Fire Danger Rating System (NFDRS) thresholds (fuel conditions, drought conditions and predicted weather patterns) for Greater Sage-Grouse habitat.	Action E-FFM 4: TMA-2.1: Strengthen and improve interagency wildfire prevention activities statewide through targeted wildfire prevention messages including education on habitat loss, updating interagency agreements, conducting wildfire prevention workshops, and demonstration projects.	Action F-FFM 4: —	
Action A-FFM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 5: —	Action C-FFM 5: —	Action D-FFM 5: Develop wildfire prevention plans that explain the resource value of Greater Sage-Grouse habitat and include fire prevention messages and actions to reduce human-caused ignitions.	Action E-FFM 5: TMA-2.1: Strengthen and improve interagency wildfire prevention activities statewide through targeted wildfire prevention messages including education on habitat loss, updating interagency agreements, conducting wildfire prevention workshops, and demonstration projects.	Action F-FFM 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 6: —	Action C-FFM 6: —	Action D-FFM 6: 2 Fuel treatments will be designed though an interdisciplinary process to expand, enhance, maintain, and protect Greater Sage-Grouse habitat. Use green strips and/or fuel breaks, where appropriate, to protect seeding efforts from subsequent fire events. In coordination with USFWS and relevant state agencies, BLM and Forest Service planning units with large blocks of Greater Sage-Grouse habitat will develop, using the assessment process described in Appendix G [of the 2015 Final EIS], Greater Sage-Grouse Wildland Fire and Invasive Species Assessment, a fuels management strategy which considers an up-to-date fuels profile, land use plan direction, current and potential habitat fragmentation, sagebrush and Greater Sage-Grouse ecological factors, and active vegetation management steps to provide critical breaks in fuel continuity, where	Action E-FFM 6: TMA-2.3: Continue the construction of targeted, well designed fuel breaks and "green strips" to break up fuel continuity, reduce fire size, and create safe areas for fire suppression activities. Use the best adapted plant materials to re-vegetate green strips with fire resistant species. Fund and schedule regular maintenance activities of green strips as needed.	Action F-FFM 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			appropriate. When developing this strategy, planning units will consider the risk of increased habitat fragmentation from a proposed action versus the risk of large scale fragmentation posed by wildfires if the action is not taken.			
Action A-FFM 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 7: —	Action C-FFM 7: —	Action D-FFM 7: Apply seasonal restriction, as needed, for implementing fuels management treatments according to the type of seasonal habitat present.	Action E-FFM 7: TMA-2.3: Continue the construction of targeted, well designed fuel breaks and "green strips" to break up fuel continuity, reduce fire size, and create safe areas for fire suppression activities. Use the best adapted plant materials to re-vegetate green strips with fire resistant species. Fund and schedule regular maintenance activities of green strips as needed.	Action F-FFM 7: —	
Action A-FFM 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 8: —	Action C-FFM 8: —	Action D-FFM 8: Annually complete a review of landscape assessment implementation efforts with appropriate USFWS and state agency personnel.	Action E-FFM 8: TMA-3.2: Update Fire Management Plans, dispatch run cards, and relevant agreements to ensure "closest forces" concepts are being utilized at all times, particularly nonfederal suppression resources (e.g. Nevada Division of Forestry helicopters, crews, and	Action F-FFM 8: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				volunteer fire departments). TMA-3.3: Establish and utilize Nevada Interagency Incident Management Teams (IMTs) for wildfires in the SGMA. Nevada currently has five Type 3 IMTs that are federally sponsored and comprised of qualified federal, state and local government employees. These IMTs ensure that the state has IMT members with knowledge of Nevada's issues and natural resources, a key advantage over out-of-area IMTs that come to manage a Nevada fire with no local understanding TMA-3.5: Integrate suppression resource locations within the SGMA and pre-position resources as conditions dictate. TMA-3.6: Develop a "suitcase" interagency suppression task force (defined as a highly-mobile that could move throughout the state rapidly) for pre-positioning during high wildfire hazard periods. Activate up to three interagency		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				"suitcase" task forces and pre-position them during Red Flag and predicted lightning events in the SGMA for initial attack response. TMA-3.14: Assign a local, trained resource advisor with Greater Sage-Grouse expertise on all fire suppression responses in the SGMA. TMA-3.1: Identify and develop suppression plans, including mapping of habitat in the SGMA, to improve initial attack suppression actions.		
Action A-FFM 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 9: —	Action C-FFM 9: —	Action D-FFM 9: Threatened, endangered, and sensitive species (including Greater Sage-Grouse) and associated habitats would continue to be a high priority for National and Geographic Multi-Agency Coordination Groups.	Action E-FFM 9: TMA-1.2: Actively manage habitat in the SGMA across all jurisdictions with the goal of restoring the appropriate role of wildfire to establish resiliency, and actively engage in prevention, suppression and restoration of the effects of fire and invasive species (State of Nevada 2012). Limit the use of fire as a management tool in Wyoming Big Sagebrush and Black Sagebrush plant communities.	Action F-FFM 9: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 10: —	Action C-FFM 10: —	Action D-FFM 10: Within acceptable risk levels utilize a full range of fire management strategies and tactics, including the management of wildfires to achieve resource objectives, across the range of Greater Sage-Grouse habitat consistent with land use plan direction.	Action E-FFM 10: TMA-3.9: Utilize the interagency Fire Planning Assessment system to optimize utilization of fire suppression resources (e.g. engines, aircraft, water tenders, and hand crews). Fire Program Analysis enables local and national planners to evaluate the effectiveness of alternative fire management strategies for the purpose of meeting fire and land management goals and objectives. TMA-3.10: Encourage use of the State's Air National Guard C-130 Unit with the Modular Airborne Firefighting System (MAFFS) for aerial firefighting support. TMA-3.11: Increase the fleet of available heavy air tankers and develop a system for prioritizing their use to fight fires when needed. TMA-3.12: Eliminate policy and operational inconsistencies by returning jurisdiction over Nevada BLM lands that are currently managed by the California Surprise Field	Action F-FFM 10: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Office, placing that jurisdiction into the Carson City and Winnemucca Field Offices. TMA-3.13: Develop a specific and concise package of information on management areas within the SGMA for incoming Incident Management Teams to ensure an understanding of Nevada conservation priorities that will be included in all Delegations of Authority and Fire Management Plans. TMA-1.5: Continue the expansion and implementation of fire suppression plans and strategies across all land jurisdictions within the SGMA.		
Action A-FFM 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 11: —	Action C-FFM 11: —	Action D-FFM 11: —	Action E-FFM 11: TMA-3.7: Within the SGMA, eliminate the tactic of "burning out," including backfiring unless there are direct life safety threats.	Action F-FFM 11: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 12: —	Action C-FFM 12: —	Action D-FFM 12: Within Greater Sage-Grouse habitat, PHMA (and PACs, if so determined by individual LUP efforts) are the highest priority for conservation and protection during fire operations and fuels management decision making. The PHMA (and PACs, if so determined by individual LUP efforts) will be viewed as more valuable than GHMA when priorities are established. When suppression resources are widely available, maximum efforts will be placed on limiting fire growth in GHMA polygons as well. These priority areas will be further refined following completion of the Greater Sage-Grouse Wildland Fire and Invasive Species Assessment described in Appendix G [of the 2015 Final EIS].	Action E-FFM 12: TMA-3.9: Utilize the interagency Fire Planning Assessment system to optimize utilization of fire suppression resources (e.g. engines, aircraft, water tenders, and hand crews). Fire Program Analysis enables local and national planners to evaluate the effectiveness of alternative fire management strategies for the purpose of meeting fire and land management goals and objectives.	Action F-FFM 12: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 13: —	Action C-FFM 13: —	Action D-FFM 13: In post-fire rehabilitation plans within PHMA and GHMA, design re-vegetation projects to (1) maintain and enhance unburned intact sagebrush communities when at risk from adjacent threats; (2) stabilize soils; (3) re-establish hydrologic function; (4) maintain and enhance biological integrity; (5) promote plant resiliency; (6) limit expansion or dominance or invasive species; and (7) reestablish native species.	Action E-FFM 13: TMA-4.4: Continue identifying and obtaining funding opportunities from Federal, State, local, industry and land users dedicated to implementing prioritized habitat enhancement, restoration, and conservation activities.	Action F-FFM 13: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 14: —	Action C-FFM 14: —	Action D-FFM 14: In PHMA and GHMA, use native plant seeds for post-fire restoration, based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter). In all cases, seed must be certified weed-free.	Action E-FFM 14: TMA-4.2: Continue the expansion of, and improvements to, the Nevada Division of Forestry Seedbank & Plant Material program in conjunction with Federal partners. Utilize Nevada Division of Forestry conservation camp crews for native seed collection and rehabilitation activities. Improve storage capabilities for native seed and desirable species that provide a competitive advantage over invasive species and improve storage capabilities to promote longevity of available seed.	Action F-FFM 14: —	
Action A-FFM 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 15: —	Action: C-FFM 15 —	Action D-FFM 15: —	Action E-FFM 15: Following fires continue the expansion and implementation of sagebrush enhancement and restoration treatments consistent with Greater Sage-Grouse management objectives in appropriate ecological sites.	Action F-FFM 15: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 16: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 16: —	Action C-FFM 16: —	Action D-FFM 16: In PHMA and GHMA, following post-fire restoration treatments, monitor and implement management actions as necessary to ensure long-term persistence of seeded or pre-burn native plants.	Action E-FFM 16: TMA-4.5: Continue to focus research and monitoring efforts through demonstration projects on improving rehabilitation and revegetation successes in harsh environments.	Action F-FFM 16: —	
Action A-FFM 17: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 17: —	Action C-FFM 17: —	Action D-FFM 17: Within PHMA and GHMA, ensure that post-fire effectiveness monitoring continues until treatment objectives are met.	Action E-FFM 17: TMA-1.1: Utilize the Nevada Sagebrush Ecosystem Council and the Nevada Sagebrush Ecosystem Technical Team to collect and consolidate funding and develop common criteria and requirements for habitat protection, restoration and monitoring.	Action F-FFM 17: —	
Action A-FFM 18: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 18: —	Action C-FFM 18: —	Action D-FFM 18: Increase post-fire restoration activities within PHMA and GHMA through the use of integrated funding opportunities with other resource programs and partners.	Action E-FFM 18: TMA-1.1: Utilize the Nevada Sagebrush Ecosystem Council and the Nevada Sagebrush Ecosystem Technical Team to collect and consolidate funding and develop common criteria and requirements for habitat protection, restoration and monitoring.	Action F-FFM 18: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 19: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 19: —	Action C-FFM 19: —	Action D-FFM 19: BLM and Forest Service planning units (Districts and Forests), in coordination with the USFWS and relevant state agencies, would complete and continue to update Greater Sage-Grouse Landscape Wildfire and Invasive Species Habitat Assessments to prioritize at risk habitats, and identify fuels management, preparedness, suppression and restoration priorities necessary to maintain sagebrush habitat to support interconnecting Greater Sage-Grouse populations. These assessments and subsequent assessment updates would also be a coordinated effort with an interdisciplinary team to take into account other Greater Sage-Grouse priorities identified in this plan. Appendix G [of the 2015 Final EIS] describes a minimal framework example and suggested approach for this assessment.	Action E-FFM 19: TMA-2.2: Continue successful landscape level habitat assessments in, and in proximity to, SGMAs to identify those habitat areas that are at the highest risk of wildland fire.	Action F-FFM 19: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM 20: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM 20: —	Action C-FFM 20: —	Action D-FFM 20: GHMA near where PHMA has been burned by wildfire will be managed as PHMA until the burned Greater Sage-Grouse habitat and use has been restored. The location and amount of GHMA to be managed as PHMA will be determined by the BLM or Forest Service and the respective state wildlife agency; in Nevada it will be determined by the Sagebrush Ecosystem Technical Team, based on site-specific evaluations.	Action E-FFM 20: —	Action F-FFM 20: —	
Fuels Management						
Action A-FFM-HFM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 1: —	Action C-FFM-HFM 1: —	Action D-FFM-HFM 1: Implement the RDFs identified in Appendix D [of the 2015 Final EIS] consistent with applicable law.	Action E-FFM-HFM 1: Implement the RDFs identified in Appendix D [of the 2015 Final EIS] consistent with applicable law.	Action F-FFM-HFM 1: —	
Action A-FFM-HFM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 2: —	Action C-FFM-HFM 2: —	Action D-FFM-HFM 2: —	Action E-FFM-HFM 2: Limit the use of fire as a management tool in Wyoming Big Sagebrush and Black Sagebrush plant communities.	Action F-FFM-HFM 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 3: —	Action C-FFM-HFM 3: —	Action D-FFM-HFM 3: Utilizing an interdisciplinary approach, a full range of fuel reduction techniques will be available. Fuel reduction techniques such as grazing, prescribed fire, chemical, biological and mechanical treatments are acceptable.	Action E-FFM-HFM 3: TMA-2.5: Continue to identify State and County highway/road and utility ROWs for fuel breaks; replacing invasive, fire prone species with fire resistant species and performing other fuels reduction treatments.	Action F-FFM-HFM 3: —	
Action A-FFM-HFM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 4: —	Action C-FFM-HFM 4: —	Action D-FFM-HFM 4: Identify opportunities for prescribed fire; including where prescribed fire has been identified as the most appropriate tool to meet fuels management objectives and Greater Sage-Grouse conservation objectives, and the potential expansion or dominance of invasive species has been determined to be minimal through an invasive species risk determination for the treatment project (see BLM Manual Section 9015).	Action E-FFM-HFM 4: TMA-2.10: Review current processes and, if necessary, develop authorities and expedite the process to utilize a suite of active vegetative treatments (e.g. mechanical, targeted livestock grazing, prescribed fire, and chemical) to reduce weed invasion and maintain resilient post-fire landscapes and control excessive fuel loading throughout the SGMA and constructed fuel breaks	Action F-FFM-HFM 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 5: —	Action C-FFM-HFM 5: —	Action D-FFM-HFM 5: Upon project completion, monitor and manage fuels projects to ensure long-term success, including persistence of seeded species and/or other treatment components. Control invasive vegetation post-treatment.	Action E-FFM-HFM 5: TMA-22.1: Develop consistent monitoring protocols and methods to be used across all land jurisdictions and agencies. Compile all project monitoring data into one Greater Sage-Grouse database managed by the Nevada Sagebrush Ecosystem Technical Team for use in adaptive management and reporting.	Action F-FFM-HFM 5: —	
Action A-FFM-HFM 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 6: —	Action C-FFM-HFM 6: —	Action D-FFM-HFM 6: Apply seasonal restriction, as needed, for implementing fuels management treatments according to the type of seasonal habitat present.	Action E-FFM-HFM 6: TMA-1.6: Following fires, continue the expansion and implementation of sagebrush enhancement and restoration treatments consistent with Greater Sage-Grouse management objectives in appropriate ecological sites.	Action F-FFM-HFM 6: —	
Action A-FFM-HFM 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 7: —	Action C-FFM-HFM 7: —	Action D-FFM-HFM 7: In coordination with USFWS and relevant state agencies, BLM and Forest Service planning units (Districts/Forests) will identify annual treatment needs for wildfire and invasive species management as identified in local unit level Landscape Wildfire	Action E-FFM-HFM 7: TMA-1.7: Continue the expansion and implementation of proactive solutions that are market-based, flexible, and take advantage of economies of scale. An example is the "good of the state" contract for fire fuels reduction services initiated by the State	Action F-FFM-HFM 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			and Invasive Species Assessments. Annual treatment needs will be coordinated across state/regional scales and across jurisdictional boundaries for long-term conservation of Greater Sage-Grouse .	Purchasing Division in November 2007 that facilitates the contracting for forest management hand crew services, forestry equipment, hauling services, road construction and rehabilitation, and controlled fire burns. Agencies within the state use these services including the Nevada Division of Forestry and the Tahoe Resource Team to meet fuel reduction objectives TMA-2.4: Continue to support a business environment that incentivizes beneficial uses of biomass and excess fuels (e.g. stewardship contracting and landscape-level long-term projects). TMA-2.7: Continue to utilize Nevada Division of Forestry conservation camp crews for fuels reduction project implementation and as federal grant match		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 8: In PHMA, design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. • Do not reduce sagebrush canopy cover to less than 15% (Connelly et al. 2000a; Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of PHMA and conserve habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in future NEPA documents. • Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area. • Allow no fuels	Action C-FFM-HFM 8: Same as Alternative A.	Action D-FFM-HFM 8: Implementation actions will be tiered to the Local (District/Forest) Greater Sage-Grouse Landscape Wildfire & Invasive Species Assessment described in GEN-1, utilizing best available science related to the conservation of Greater Sage-Grouse .	Action E-FFM-HFM 8: TMA-2.6: Continue to identify and utilize all cross-boundary authorities available to improve project coordination and implementation on the ground.	Action F-FFM-HFM 8: Design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems. • Do not reduce sagebrush canopy cover to less than 15% (Connelly et al. 2000a; Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of occupied Greater Sage-Grouse habitat and conserve habitat quality for the species. • Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in the EA process. • Apply appropriate seasonal	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality. • Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000a; Hagen et al. 2007; Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have been explored and site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory (Brown 1982).				restrictions for implementing fuels management treatments according to the type of seasonal habitats present. • Allow no fuels treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality. • Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000a; Hagen et al. 2007; Beck et al. 2009). However, if as a last resort and after all other treatment	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	• Monitor and control invasive vegetation post-treatment. • Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise (WGFD 2011). • Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet Greater Sage-Grouse habitat objectives (Pyke 2011). • Design post fuels management projects to ensure long-term persistence of seeded or pre-treatment native plants. This may require temporary or long-term changes in livestock grazing management, wild				opportunities have been explored and site-specific variables allow, the use of prescribed fire for that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory (Brown 1982). • Design post fuels management projects to ensure long-term persistence of seeded or pre-treatment native plants, including sagebrush. This may require temporary or long-term changes in livestock grazing management, wild horse and burro management, travel management, or	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	horse and burro management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006).				other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006).	
Action A-FFM-HFM 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 9: —	Action C-FFM-HFM 9: Lands will be managed to be in the good or better ecological condition to help minimize adverse impacts of fire.	Action D-FFM-HFM 9: —	Action E-FFM-HFM 9: —	Action F-FFM-HFM 9: —	
Action A-FFM-HFM 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 10: —	Action C-FFM-HFM 10: Any fuels treatments will focus on interfaces with human habitation or significant existing disturbances.	Action D-FFM-HFM 10: —	Action E-FFM-HFM 10: —	Action F-FFM-HFM 10: —	
Action A-FFM-HFM 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 11: Design fuels management projects in PHMA to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007).	Action C-FFM-HFM 11: Same as Alternative A.	Action D-FFM-HFM 11: —	Action E-FFM-HFM 11: TMA-2.9: Review current processes and, if necessary, the Federal agencies should obtain authority and expedite the process to implement vegetative treatments for fuels reduction projects in strategic areas for protection of sagebrush habitat	Action F-FFM-HFM 11: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 12: During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011; Launchbaugh et al. 2007). Consult with ecologists to minimize impacts on native perennial grasses.	Action C-FFM-HFM 12: Same as Alternative A.	Action D-FFM-HFM 12: —	Action E-FFM-HFM 12: TMA-2.10: Review current processes and, if necessary, develop authorities and expedite the process to utilize a suite of active vegetative treatments (e.g. mechanical, targeted livestock grazing, prescribed fire, and chemical) to reduce weed invasion and maintain resilient post-fire landscapes and control excessive fuel loading throughout the SGMA and constructed fuel breaks.	Action F-FFM-HFM 12: —	
Action A-FFM-HFM 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 13: —	Action C-FFM-HFM 13: —	Action D-FFM-HFM 13: —	Action E-FFM-HFM 13: Manage wildland fires in the SGMA to reduce the number of wildfires that escape initial attack and become greater than 300 acres down to two to three percent of all wildfire ignitions over a ten year period. In this context, fire should not be used in Phase III Pinyon and/or Juniper areas due to a lack of a sufficient sagebrush seed stock in the ground.	Action F-FFM-HFM 13: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 14: —	Action C-FFM-HFM 14: —	Action D-FFM-HFM 14: —	Action E-FFM-HFM 15: Identify and develop suppression plans, including mapping of the SGMA, to improve initial attack suppression actions.	Action F-FFM-HFM 14: —	
Action A-FFM-HFM 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 15: —	Action C-FFM-HFM 15: —	Action D-FFM-HFM 15: —	Action E-FFM-HFM 15: Increase initial attack capability by training and equipping volunteer firefighters, as well as agricultural and other industry work forces for assignment during periods of high fire activity. Trained volunteers who are remotely located will serve as first responders when necessary and appropriate.	Action F-FFM-HFM 15: —	
Action A-FFM-HFM 16: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 16: —	Action C-FFM-HFM 16: —	Action D-FFM-HFM 16: —	Action E-FFM-HFM 16: Integrate suppression resource locations within the SGMA and pre-position resources as conditions dictate.	Action F-FFM-HFM 16: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 17: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 17: In PHMA, prioritize suppression, immediately after life and property, to conserve the habitat.	Action C-FFM-HFM 17: Same as Alternative A.	Action D-FFM-HFM 17: Fire fighter and public safety are the highest priority. Greater Sage-Grouse habitat will be prioritized commensurate with property values and other important habitat to be protected, with the goal to restore, enhance, and maintain areas suitable for Greater Sage-Grouse .	Action E-FFM-HFM 17: TMA-3: Manage wildland fires in the SGMA to reduce the number of wildfires that escape initial attack and become greater than 300 acres down to two to three percent of all wildfire ignitions over a ten year period. In this context, fire should not be used in Phase III Pinyon and/or Juniper areas due to a lack of a sufficient sagebrush seed stock in the ground.	Action F-FFM-HFM 17: Same as Alternative B.	
Action A-FFM-HFM 18: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 18: In GHMA, prioritize suppression where wildfires threaten PHMA.	Action C-FFM-HFM 18: Same as Alternative A.	Action D-FFM-HFM 18: —	Action E-FFM-HFM 18: TMA-3: Manage wildland fires in the SGMA to reduce the number of wildfires that escape initial attack and become greater than 300 acres down to two to three percent of all wildfire ignitions over a ten year period. In this context, fire should not be used in Phase III Pinyon and/or Juniper areas due to a lack of a sufficient sagebrush seed stock in the ground.	Action F-FFM-HFM 18: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 19: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 19: Follow BMPs (WO IM 2013-128).	Action C-FFM-HFM 19: Same as Alternative A.	Action D-FFM-HFM 19: Implement the RDFs identified in Appendix D [of the 2015 Final EIS] consistent with applicable law.	Action E-FFM-HFM 19: TMA-5: Through the Nevada Sagebrush Ecosystem Council, utilizing the avoid, minimize, and mitigate strategy, and with the goal of restoring the appropriate role of wildfire, the following successful Nevada Division of Forestry programs that are a benefit to Greater Sage-Grouse will continue. TMA-5.1: Continue statewide resource programs, including: • Native seed collection, cleaning, bagging, storage, and application with quad seeders and seed drills. • Private landowner technical assistance, project implementation and cost share grants for Pinyon and/or Juniper removal (Forest Health) in sagebrush habitats; fuels reduction; green stripping; prescribed fire; and related habitat improvements on nonfederal lands. • Federal and state land project implementation	Action F-FFM-HFM 19: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				through contracts for numerous vegetation improvement projects, water developments, timber stand improvements, fuels reduction, and green stripping. TMA-5.2: Continue statewide fire programs, including: • Fuels reduction planning, technical assistance, cost share grants and project implementation on state and private lands as well as assisting federal agency projects. • The Nevada Division of Forestry Wildland Fire Program to improve wildfire management in participating counties through strengthened initial attack, landowner education, improved coordination with federal land managers, and fuels reduction. TMA-5.3: Continue the Nevada Division of Forestry Conservation Camp Program that: Provides a trained statewide labor force that can be utilized for		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				numerous Greater Sage-Grouse mitigation activities and for wildland fire suppression (State of Nevada 2004).		
Action A-FFM-HFM 20: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 20: Prioritize native seed allocation for use in Greater Sage-Grouse habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from Emergency Stabilization and Rehabilitation (ESR) (BLM) and/or Burn Area Emergency Rehabilitation (Forest Service) projects outside of PHMA to those inside it. Use of native plant seeds for ESR or Burn Area Emergency Rehabilitation seedings is required based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet Greater Sage-	Action C-FFM-HFM 20: Livestock and other disturbed areas will be seeded with local native ecotypes of shrubs, grasses and forbs.	Action D-FFM-HFM 20: In PHMA and GHMA, give preference to use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, nonnative seeds may be used as long as they support Greater Sage-Grouse habitat objectives. Choose native plant species outlined in ESDs (Forest Service may use a similar process), where available, to re-vegetate sites. If the commercial supply of appropriate native seed/plants is limited, work with the BLM Native Plant Materials Development Program or NRCS Plant Material Program through your respective State or Forest Supervisor's Office Plant Conservation Program Lead. If	Action E-FFM-HFM 20: TMA-4.2: Continue the expansion of, and improvements to, the Nevada Division of Forestry Seedbank & Plant Material program in conjunction with Federal, state and local jurisdiction partners. Utilize Nevada Division of Forestry conservation camp crews to collect native and adapted seed, and for other appropriate rehabilitation activities. Improve storage capabilities for native seed and desirable species that provide a competitive advantage over invasive species; and, improve storage capabilities to promote longevity of available seed.	Action F-FFM-HFM 20: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	Grouse habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.		currently available supplies are limited, use the materials that provide the greatest benefit for Greater Sage-Grouse . In all cases seed must be certified weed-free.			
Action A-FFM-HFM 21: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 21: Design post ESR and Burn Area Emergency Rehabilitation management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management to achieve and maintain the desired condition of ESR and Burn Area Emergency Rehabilitation projects to benefit Greater Sage-Grouse (Eiswerth and Shonkwiler 2006).	Action C-FFM-HFM 21: Same as Alternative A.	Action D-FFM-HFM 21: —	Action E-FFM-HFM 21: TMA-4.1: Complete burn severity assessments and identify ecological site potential in, and in proximity to, the SGMA to identify the areas with the highest potential for restoration of habitat functions following fires. Focus rehabilitation efforts on areas of highest potential success based ecological site conditions (soils, precipitation zone, and geography). Utilize revegetation seed mixtures that include native and adapted plant seed that will quickly stabilize soils, help to provide long-term hazardous fuels reduction, and increase ecosystem resiliency in appropriate locations.	Action F-FFM-HFM 21: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 22: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 22: Consider potential changes in climate (Miller at al. 2011) when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed. (Kramer and Havens 2009).	Action C-FFM-HFM 22: Same as Alternative A.	Action D-FFM-HFM 22: Same as Alternative A.	Action E-FFM-HFM 22: —	Action F-FFM-HFM 22: Same as Alternative B.	
Action A-FFM-HFM 23: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 23: —	Action C-FFM-HFM 23: —	Action D-FFM-HFM 23: —	Action E-FFM-HFM 23: —	Action F-FFM-HFM 23: Establish and strengthen networks with seed growers to assure availability of native seed for ESR projects.	
Action A-FFM-HFM 24: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 24: —	Action C-FFM-HFM 24: —	Action D-FFM-HFM 24: —	Action E-FFM-HFM 24: —	Action F-FFM-HFM 24: Post fire recovery must include establishing adequately sized exclosures (free of livestock grazing) that can be used to assess recovery.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 25: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 25: —	Action C-FFM-HFM 25: —	Action D-FFM-HFM 25: —	Action E-FFM-HFM 25: —	Action F-FFM-HFM 25: Livestock grazing should be excluded from burned areas until woody and herbaceous plants achieve Greater Sage-Grouse habitat objectives.	
Action A-FFM-HFM 26: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 26: —	Action C-FFM-HFM 26: —	Action D-FFM-HFM 26: —	Action E-FFM-HFM 26: —	Action F-FFM-HFM 26: Where burned Greater Sage-Grouse habitat cannot be fenced from other unburned habitat, the entire area (e.g., allotment/ pasture) should be closed to grazing until recovered.	
Action A-FFM-HFM 27: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 27: —	Action C-FFM-HFM 27: Mowing of grass will be used in any fuel break fuels reduction project (roadsides or other areas).	Action D-FFM-HFM 27: —	Action E-FFM-HFM 27: —	Action F-FFM-HFM 27: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 28: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 28: —	Action C-FFM-HFM 28: —	Action D-FFM-HFM 28: —	Action E-FFM-HFM 28: Protect, maintain and improve sagebrush habitat statewide over time by treating, rehabilitating and restoring at least as many acres of Greater Sage-Grouse habitat as are lost to wildfire.	Action F-FFM-HFM 28: —	
Action A-FFM-HFM 29: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 29: —	Action C-FFM-HFM 29: —	Action D-FFM-HFM 29: —	Action E-FFM-HFM 29: Utilize the Nevada Sagebrush Ecosystem Council and the Nevada Sagebrush Ecosystem Technical Team to collect and consolidate funding and develop common criteria and requirements for habitat protection, restoration and monitoring.	Action F-FFM-HFM 29: —	
Action A-FFM-HFM 30: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 30: —	Action C-FFM-HFM 30: —	Action D-FFM-HFM 30: —	Action E-FFM-HFM 30: Support the Nevada Division of Forestry's "Wildland Fire Protection Program," a statewide comprehensive wildfire management program that engages all interagency partners (federal, state & local), to reduce the threats of catastrophic wildfire, rapidly suppress wildfires, and rehabilitate lands damaged by wildfire.	Action F-FFM-HFM 30: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 31: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 31: —	Action C-FFM-HFM 31: —	Action D-FFM-HFM 31: —	Action E-FFM-HFM 31: Continue the expansion and implementation of proactive solutions that are market-based, flexible, and take advantage of economies of scale.	Action F-FFM-HFM 31: —	
Action A-FFM-HFM 32: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 32: —	Action C-FFM-HFM 32: —	Action D-FFM-HFM 32: —	Action E-FFM-HFM 32: Continue successful landscape level habitat assessments in, and in proximity to, the SGMA to identify those habitat areas that are at the highest risk of wildland fire.	Action F-FFM-HFM 32: —	
Action A-FFM-HFM 33: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 33: —	Action C-FFM-HFM 33: —	Action D-FFM-HFM 33: —	Action E-FFM-HFM 33: Continue to support a business environment that incentivizes beneficial uses of biomass and excess fuels (e.g. stewardship, contracting, and landscape-level long-term projects).	Action F-FFM-HFM 33: —	
Action A-FFM-HFM 34: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 34: —	Action C-FFM-HFM 34: —	Action D-FFM-HFM 34: —	Action E-FFM-HFM 34: Continue to identify and utilize all cross-boundary authorities available to improve project coordination and implementation on the ground.	Action F-FFM-HFM 34: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 35: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 35: —	Action C-FFM-HFM 35: —	Action D-FFM-HFM 35: —	Action E-FFM-HFM 35: Continue to utilize Nevada Division of Forestry conservation camp crews for fuels reduction project implementation and as federal grant match.	Action F-FFM-HFM 35: —	
Action A-FFM-HFM 36: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 36: —	Action C-FFM-HFM 36: —	Action D-FFM-HFM 36: —	Action E-FFM-HFM 36: Continue to successfully treat existing areas of invasive vegetative that pose a threat to the SGMA through the use of herbicides, fungicides or bacteria to control cheatgrass and medusahead infestations.	Action F-FFM-HFM 36: —	
Action A-FFM-HFM 37: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 37: —	Action C-FFM-HFM 37: —	Action D-FFM-HFM 37: —	Action E-FFM-HFM 37: Update Fire Management Plans, dispatch run cards, and relevant agreements to ensure "closest forces" concepts are being utilized at all times, particularly nonfederal suppression resources (e.g. Nevada Division of Forestry helicopters, crews, and volunteer fire departments).	Action F-FFM-HFM 37: —	
Action A-FFM-HFM 38: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 38: —	Action C-FFM-HFM 38: —	Action D-FFM-HFM 38: —	Action E-FFM-HFM 38: Establish and utilize IMTs for wildfires in the SGMA.	Action F-FFM-HFM 38: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 39: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 39: —	Action C-FFM-HFM 39: —	Action D-FFM-HFM 39: —	Action E-FFM-HFM 39: Develop a "suitcase" interagency suppression task force for pre-positioning during high wildfire hazard periods. Activate up to three interagency "suitcase" task forces and pre-position them during Red Flag and predicted lightning events in the SGMA for initial attack response.	Action F-FFM-HFM 39: —	
Action A-FFM-HFM 40: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 40: —	Action C-FFM-HFM 40: —	Action D-FFM-HFM 40: —	Action E-FFM-HFM 40: Within the SGMA, eliminate the tactic of "burning out," including backfiring unless there are direct life safety threats.	Action F-FFM-HFM 40: —	
Action A-FFM-HFM 41: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 41: —	Action C-FFM-HFM 41: —	Action D-FFM-HFM 41: —	Action E-FFM-HFM 41: Designate Occupied and Suitable Habitat in the SGMA as a "high priority value" for suppression resource allocation in the Geographical Area Coordination Centers and within the FEMA Fire Management Assistance Grant criteria.	Action F-FFM-HFM 41: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 42: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 42: —	Action C-FFM-HFM 42: —	Action D-FFM-HFM 42: —	Action E-FFM-HFM 42: Utilize the interagency Fire Planning Assessment system to optimize utilization of fire suppression resources (e.g. engines, aircraft, water tenders, and hand crews). Fire Program Analysis enables local and national planners to evaluate the effectiveness of alternative fire management strategies for the purpose of meeting fire and land management goals and objectives	Action F-FFM-HFM 42: —	
Action A-FFM-HFM 43: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 43: —	Action C-FFM-HFM 43: —	Action D-FFM-HFM 43: —	Action E-FFM-HFM 43: Encourage use of the State's Air National Guard C-130 Unit with the Modular Airborne Firefighting System (MAFFS) for aerial firefighting support.	Action F-FFM-HFM 43: —	
Action A-FFM-HFM 44: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 44: —	Action C-FFM-HFM 44: —	Action D-FFM-HFM 44: —	Action E-FFM-HFM 44: Increase the fleet of available heavy air tankers and develop a system for prioritizing their use to fight fires when needed.	Action F-FFM-HFM 44: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 45: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 45: —	Action C-FFM-HFM 45—	Action D-FFM-HFM 45: —	Action E-FFM-HFM 45: Eliminate policy and operational inconsistencies by returning jurisdiction over Nevada BLM lands that are currently managed by the California Surprise Field Office, placing that jurisdiction into the Carson City and Winnemucca Field Offices.	Action F-FFM-HFM 45: —	
Action A-FFM-HFM 46: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 46: —	Action C-FFM-HFM 46: —	Action D-FFM-HFM 46: —	Action E-FFM-HFM 46: Develop a specific and concise package of information on management areas within the SGMA for incoming IMTs to ensure an understanding of Nevada conservation priorities that will be included in all Delegations of Authority and Fire Management Plans.	Action F-FFM-HFM 46: —	
Action A-FFM-HFM 47: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 47: —	Action C-FFM-HFM 47: —	Action D-FFM-HFM 47: —	Action E-FFM-HFM 47: Assign a local, trained resource advisor with Greater Sage-Grouse expertise on all fire suppression responses in the SGMA.	Action F-FFM-HFM 47: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 48: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 48: —	Action C-FFM-HFM 48: —	Action D-FFM-HFM 48: —	Action E-FFM-HFM 48: Carefully review and evaluate all burned areas within the SGMA in a timely manner to ascertain the reclamation potential for reestablishing Greater Sage-Grouse habitat, enhancing ecosystem resiliency, and controlling invasive weed species.	Action F-FFM-HFM 48: —	
Action AFFM-HFM 49: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 49: —	Action C-FFM-HFM 49: —	Action D-FFM-HFM 49: —	Action E-FFM-HFM 49: Complete burn severity assessments and identify ecological site potential in, and in proximity to, the SGMA to identify the areas with the highest potential for restoration of habitat functions following fires. Focus rehabilitation efforts on areas of highest potential success based ecological site conditions (soils, precipitation zone, and geography). Utilize revegetation seed mixtures that include native and adapted plant seed that will quickly stabilize soils, help to provide long-term hazardous fuels reduction, and increase ecosystem resiliency in appropriate locations.	Action F-FFM-HFM 49: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 50: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 50: —	Action C-FFM-HFM 50: —	Action D-FFM-HFM 50: —	Action E-FFM-HFM 50: Continue the expansion of, and improvements to, the Nevada Division of Forestry Seedbank & Plant Material program in conjunction with Federal, state and local jurisdiction partners. Utilize Nevada Division of Forestry conservation camp crews to collect native and adapted seed, and for other appropriate rehabilitation activities. Improve storage capabilities for native seed and desirable species that provide a competitive advantage over invasive species; and, improve storage capabilities to promote longevity of available seed.	Action F-FFM-HFM 50: —	
Action A-FFM-HFM 51: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 51: —	Action C-FFM-HFM 51: —	Action D-FFM-HFM 51: —	Action E-FFM-HFM 51: Continue developing plans and acquiring the necessary resources (e.g. seed collection, seeding equipment pools, and trained staff) for post fire rehabilitation activities and warehouse viable seed stockpiles.	Action F-FFM-HFM 51: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 52: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 52: —	Action C-FFM-HFM 52: —	Action D-FFM-HFM 52: —	Action E-FFM-HFM 52: Continue identifying and obtaining funding opportunities from federal, state, local, industry and land users dedicated to implementing prioritized habitat enhancement, restoration, and conservation activities.	Action F-FFM-HFM 52: —	
Action A-FFM-HFM 53: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 53: —	Action CFFM-HFM 53: —	Action D-FFM-HFM 53: —	Action E-FFM-HFM 53: Continue to focus research and monitoring efforts through demonstration projects on improving rehabilitation and revegetation successes in harsh environments.	Action F-FFM-HFM 53: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 54: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 54: —	Action C-FFM-HFM 54: —	Action D-FFM-HFM 54: —	Action E-FFM-HFM 54: Continue statewide resource programs, including: • Native seed collection, cleaning, bagging, storage, and application with quad seeders and seed drills. • Private landowner technical assistance, project implementation and cost share grants for Pinyon and/or Juniper removal (Forest Health) in sagebrush habitats; fuels reduction; green stripping; prescribed fire; and related habitat improvements on nonfederal lands. • Federal and state land project implementation through contracts for numerous vegetation improvement projects, water developments, timber stand improvements, fuels reduction, and green stripping.	Action F-FFM-HFM 54: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 55: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 55: —	Action C-FFM-HFM 55: —	Action D-FFM-HFM 55: —	Action E-FFM-HFM 55: Continue statewide fire programs, including: • Fuels reduction planning, technical assistance, cost share grants and project implementation on state and private lands as well as assisting federal agency projects. • The Nevada Division of Forestry Wildland Fire Program to improve wildfire management in participating counties through strengthened initial attack, landowner education, improved coordination with federal land managers, and fuels reduction.	Action F-FFM-HFM 55: —	
Action A-FFM-HFM 56: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 56: —	Action C-FFM-HFM 56: —	Action D-FFM-HFM 56: —	Action E-FFM-HFM 56: Continue the Nevada Division of Forestry Conservation Camp Program.	Action F-FFM-HFM 56: —	
Action A-FFM-HFM 57: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 57: —	Action C-FFM-HFM 57: —	Action D-FFM-HFM 57: —	Action E-FFM-HFM 57: Continue the following statewide resource programs: • Nevada Department of Agriculture, per Nevada Revised Statute, is charged with enforcing regulation that require landowners to remove	Action F-FFM-HFM 57: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				and or control invasive, noxious plants species that would otherwise alter habitat. • Biological control program that obtains, releases, and monitors a variety of agents (invertebrates & fungi) which have been approved by USDA-APHIS, to control specific noxious weeds to restore and retain natural habitat. • Seed lot inspections are conducted to ensure the viability of seed and the absence of invasive, noxious plant species for rangeland restoration projects conducted by the BLM, Forest Service, and other local agencies, governments and groups. • Pesticide applicator education, training, and licensing to ensure that pesticide applications are conducted properly on and around habitat.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-HFM 58: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 58: —	Action C-FFM-HFM 58: —	Action D-FFM-HFM 58: —	Action E-FFM-HFM 58: Continue Nevada Department of Agriculture statewide surveys for the detection of incipient invasive and noxious plants in conjunction with United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS) and the Nevada Department of Transportation.	Action F-FFM-HFM 58: —	
Action A-FFM-HFM 59: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-HFM 59: —	Action C-FFM-HFM 59: —	Action D-FFM-HFM 59: —	Action E-FFM-HFM 59: Continue statewide Weed Seed Free Forage and Gravel Certification Program.	Action F-FFM-HFM 59: —	
Climate Change						
Action A-FFM-CC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-CC 1: —	Action C-FFM-CC 1: —	Action D-FFM-CC 1: Work cooperatively with multiple agencies and stakeholders to establish and maintain a network of climate monitoring sites and stations.	Action E-FFM-CC 1: See Role of Sagebrush Ecosystem Technical Team.	Action F-FFM-CC 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFM-CC 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFM-CC 2: —	Action C-FFM-CC 2: —	Action D-FFM-CC 2: As climate change data become available through REAs or other ecological studies, identify areas of unfragmented Greater Sage-Grouse habitat and habitat linkages that provide the life-cycle and genetic transfer needs for Greater Sage-Grouse . Manage the identified areas as PHMA.	Action E-FFM-CC 2: See Role of Sagebrush Ecosystem Technical Team.	Action F-FFM-CC 2: —	
Livestock Grazing						
Action A-LG 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 1: —	Action C-LG 1: No grazing will be allowed in PHMA. Livestock grazing will be phased out over a period of three years, in accordance with grazing regulations 4110.4-2.	Action D-LG 1: —	Action E-LG 1: —	Action F-LG 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 2: Within PHMA, incorporate Greater Sage-Grouse habitat objectives and management considerations into all BLM and Forest Service grazing allotments through AMPs or permit renewals and/or Forest Service Annual Operating Instructions.	Action C-LG 2: —	Action D-LG 2: Within PHMA and GHMA containing Greater Sage-Grouse nesting habitat, implement the following management actions, if not meeting Greater Sage-Grouse habitat objectives: • Provide periods of rest or deferment during critical herbaceous growth period • Limit grazing duration to allow plant growth sufficient to meet Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter) • Employ herd management techniques to minimize impacts of livestock on nesting habitat during the nesting season (March 1 – June 30).	Action E-LG 2: Within Greater Sage-Grouse habitat, incorporate Greater Sage-Grouse habitat objectives (see Table 2-2) and management considerations into all BLM and Forest Service grazing allotments through allotment management plans (AMPs), multiple use decisions, or permit renewals and/or Forest Service Annual Operating Instructions. Implement appropriate prescribed grazing conservation actions at scales sufficient to influence a positive population response in Greater Sage-Grouse habitat, such as NRCS conservation Practice Standard 528 for prescribed grazing (NRCS 2011).	Action F-LG 2: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 3: In priority habitat, work cooperatively on integrated ranch planning within Greater Sage-Grouse habitat so operations with deeded/BLM and/or Forest Service allotments can be planned as single units.	Action C-LG 3: —	Action D-LG 3: —	Action E-LG 3: In Greater Sage-Grouse habitat, work cooperatively on integrated ranch planning within Greater Sage-Grouse habitat so operations with deeded land, and BLM and/or Forest Service allotments, can be planned as single units, providing flexibility and adaptive management across all ownership and not altering stocking rates on operations for progressive management decisions.	Action F-LG 3: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 4: Prioritize completion of land health assessments (Forest Service may use other analyses) and processing grazing permits within PHMA. Focus this process on allotments that have the best opportunities for conserving, enhancing or restoring habitat for Greater Sage-Grouse . Utilize BLM Ecological Site Descriptions (ESDs) (Forest Service may use other methods) to conduct land health assessments to determine if standards of range-land health are being met.	Action C-LG 4: —	Action D-LG 4: Continue land health assessments on BLM public lands or other monitoring methods on National Forest System lands in PHMA and GHMA to evaluate current conditions as compared to Greater Sage-Grouse habitat objectives described in Table 2-11 in section 2.8.5 of this Chapter. Incorporate the results of BLM and Forest Service monitoring and land health assessments into future management applications to ensure progress toward meeting Greater Sage-Grouse habitat objectives.	Action E-LG 4: Continue land health assessments on BLM public lands or other monitoring methods on Forest Service-administered lands in Greater Sage-Grouse habitat to evaluate current conditions as compared to Greater Sage-Grouse habitat objectives described in Table 2-2. Incorporate the results of BLM and Forest Service monitoring and land health assessments into future management applications to ensure progress toward meeting Greater Sage-Grouse habitat objectives. Incorporate terms and conditions into grazing permits and adjust these as needed through monitoring and adaptive management to meet Greater Sage-Grouse habitat objectives.	Action F-LG 4: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG-5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG-5: In PHMA, conduct land health assessments that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving Greater Sage-Grouse habitat objectives (Doherty et al. 2011). If local/state seasonal habitat objectives are not available, use Greater Sage-Grouse habitat recommendations from Connelly et al. 2000b and Hagen et al. 2007.	Action C-LG 5: —	Action D-LG 5: —	Action E-LG 5: Continue land health assessments on BLM public lands or other monitoring methods on Forest Service-administered lands in Greater Sage-Grouse habitat to evaluate current conditions as compared to Greater Sage-Grouse habitat objectives described in Table 2-2. Incorporate the results of BLM and Forest Service monitoring and land health assessments into future management applications to ensure progress toward meeting Greater Sage-Grouse habitat objectives. Incorporate terms and conditions into grazing permits and adjust these as needed through monitoring and adaptive management to meet Greater Sage-Grouse habitat objectives.	Action F-LG 5: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 6: Develop specific objectives to conserve, enhance or restore PHMA based on BLM ESDs (Forest Service may use other methods) and assessments (including within wetlands and riparian areas). If an effective grazing system that meets Greater Sage-Grouse habitat requirements is not already in place, analyze at least one alternative that conserves, restores or enhances Greater Sage-Grouse habitat in the NEPA document prepared for the permit renewal (Doherty et al. 2011; Williams et al. 2011).	Action C-LG 6: —	Action D-LG 6: —	Action E-LG 6: Implement management actions (grazing decisions, Annual Operating Instructions [Forest Service only], AMP/Conservation Plan development, or other agreements) to modify grazing management to show progress toward meeting seasonal Greater Sage-Grouse habitat objectives as defined in Table 2-2 where current livestock grazing is identified as the causal factor of not meeting those objectives. Consider singly, or in combination, changes in: 1. Season, timing (duration) and/or rotation of use; 2. Distribution of livestock use; 3. Intensity of use; 4. Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011); and 5. Numbers/ AUMs of livestock and other ungulates (includes temporary nonrenewable use, and nonuse). Before imposing grazing restrictions or seeking	Action F-LG 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				changes in livestock stocking rates or seasons of permitted use, federal agencies in coordination with grazing permittees must identify and implement all economically and technically feasible livestock distribution, forage production enhancement, weed control programs, prescribed grazing systems, off-site water development by the water rights holder, shrub and pinyon and/or juniper control, livestock salting/supplementing plans, and establishment of riparian pastures and herding. (Eureka County Master Plan 2010) There shall be no unmitigated loss of AUMs.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 7: In PHMA, manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve Greater Sage-Grouse seasonal habitat objectives.	Action C-LG 7: —	Action D-LG 7: —	Action E-LG 7: Implement management actions (grazing decisions, Annual Operating Instructions [Forest Service only], AMP/Conservation Plan development, or other agreements) to modify grazing management to show progress toward meeting seasonal Greater Sage-Grouse habitat objectives as defined in Table 2-2 where current livestock grazing is identified as the causal factor of not meeting those objectives. Consider singly, or in combination, changes in: 1. Season, timing (duration) and/or rotation of use; 2. Distribution of livestock use; 3. Intensity of use; 4. Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011); and 5. Numbers/ AUMs of livestock and other ungulates (includes temporary nonrenewable use, and nonuse). Before imposing grazing restrictions or seeking	Action F-LG 7: Manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve Greater Sage-Grouse habitat objectives.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				changes in livestock stocking rates or seasons of permitted use, federal agencies in coordination with grazing permittees must identify and implement all economically and technically feasible livestock distribution, forage production enhancement, weed control programs, prescribed grazing systems, off-site water development by the water rights holder, shrub and pinyon and/or juniper control, livestock salting/supplementing plans, and establishment of riparian pastures and herding. (Eureka County Master Plan 2010) There shall be no unmitigated loss of AUMs.		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 8: Implement management actions (grazing decisions, Annual Operating Instructions [Forest Service only], AMP/Conservation Plan development, or other agreements) to modify grazing management to meet seasonal Greater Sage-Grouse habitat requirements (Connelly et al. 2011). Consider singly, or in combination, changes in: 1) Season or timing of use; 2) Numbers of livestock (includes temporary nonuse or livestock removal); 3) Distribution of livestock use; 4) Intensity of use; and 5) Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011).	Action C-LG 8: —	Action D-LG 8: —	Action E-LG 8: Implement management actions (grazing decisions, Annual Operating Instructions [Forest Service only], AMP/Conservation Plan development, or other agreements) to modify grazing management to meet seasonal Greater Sage-Grouse habitat objectives as defined in Table 2-2 where current livestock grazing is identified as the causal factor of not meeting those objectives. Consider singly, or in combination, changes in: 1. Season, timing (duration) and/or rotation of use; 2. Distribution of livestock use; 3. Intensity of use; 4. Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011); and 5. Numbers/ AUMs of livestock and other ungulates (includes temporary nonrenewable use, and nonuse). Before imposing grazing restrictions or seeking changes in livestock	Action F-LG 8: Implement management actions (grazing decisions, AMP/Conservation Plan Development, or other plans or agreements) to modify grazing management to meet seasonal Greater Sage-Grouse habitat requirements (Connelly et al. 2011). Consider singly, or in combination, changes in: 1) Season, timing, and/or frequency of livestock use 2) Numbers/AUMs of livestock (includes temporary non-use or livestock removal) 3) Distribution of livestock use 4) Intensity of livestock use 5) Type of	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				stocking rates or seasons of permitted use, federal agencies in coordination with grazing permittees must identify and implement all economically and technically feasible livestock distribution, forage production enhancement, weed control programs, prescribed grazing systems, off-site water development by the water rights holder, shrub and pinyon and/or juniper control, livestock salting/supplementing plans, and establishment of riparian pastures and herding. (Eureka County Master Plan 2010) There shall be no unmitigated loss of AUMs.	livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats; Briske et al. 2011).	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 9: During drought periods, prioritize evaluating effects of the drought in PHMA relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets Greater Sage-Grouse needs in PHMA.	Action C-LG 9: —	Action D-LG 9: —	Action E-LG 9: When conditions, i.e., climatic variations (such as drought) and wildfire, requiring unique or exceptional management, work to protect Greater Sage-Grouse habitat on a case by case basis and implement adaptive management to allow for vegetation recovery that meets resistance, resilience, and Greater Sage-Grouse life cycle needs in Greater Sage-Grouse habitat as needed on an individual allotment basis.	Action F-LG 9: During drought periods, prioritize evaluating effects of drought in Greater Sage-Grouse habitat areas relative to their biological needs, as well as drought effects on ungrazed reference areas. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999; Cagney et al. 2010), ensure that post-drought management allows for vegetation recovery that meets Greater Sage-Grouse needs in Greater Sage-Grouse habitat areas based on Greater Sage-Grouse habitat objectives.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 10: Manage riparian areas and wet meadows for proper functioning condition or other similar methodology (Forest Service only) within PHMA.	Action C-LG 10: —	Action D-LG 10: Manage riparian areas and wet meadows for proper functioning condition (Forest Service may use other analysis) within PHMA and GHMA.	Action E-LG 10: Grazing management strategies for riparian areas and wet meadows should, at a minimum, maintain or achieve riparian Proper Functioning Condition (PFC) and promote brood rearing/summer habitat objectives, as described in Table 2-2, within Greater Sage-Grouse habitat. Within Greater Sage-Grouse habitat, manage wet meadows to maintain a component of available perennial forbs with diverse species richness to facilitate brood rearing and stabilizing riparian species (Burton et al. 2011) near where water flows to achieve or maintain PFC. Use Ecological Site Descriptions (ESDs) or locally relevant information about soils, hydrology, soil moisture, and site potential to set realistic objectives and evaluate assessments and monitoring data (Swanson et al. 2006). Also conserve or enhance wet meadow complexes to maintain or increase amount of edge and cover near that edge to minimize elevated	Action F-LG 10: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010) as observed throughout the reach of the stream/watershed and not on specific sites. Some defined areas of concentrated use may be necessary to protect and enhance the overall riparian area.		
Action A-LG 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 11: Within PHMA and GHMA, manage wet meadows to maintain a component of perennial forbs with diverse species richness relative to site potential (e.g., reference state) to facilitate brood rearing. Also conserve or enhance these wet meadow complexes to maintain or increase amount of edge and cover within that edge to minimize elevated mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010).	Action C-LG 11: No similar action	Action D-LG 11: No similar action	Action E-LG 11: Grazing management strategies for riparian areas and wet meadows should, at a minimum, maintain or achieve riparian Proper Functioning Condition (PFC) and promote brood rearing/summer habitat objectives, as described in Table 2-2, within Greater Sage-Grouse habitat. Within Greater Sage-Grouse habitat, manage wet meadows to maintain a component of available perennial forbs with diverse species richness to facilitate brood rearing and stabilizing riparian species (Burton et al. 2011) near where water flows to achieve or maintain PFC. Use Ecological Site Descriptions (ESDs) or	Action F-LG 11: Within Greater Sage-Grouse habitats, manage wet meadows to maintain a component of perennial forbs with diverse species richness and productivity relative to site potential (e.g., reference state) to facilitate brood rearing. Also conserve or enhance these wet meadow complexes to maintain or increase the amount of edge and cover within that edge to minimize elevated mortality during the late brood-rearing	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				locally relevant information about soils, hydrology, soil moisture, and site potential to set realistic objectives and evaluate assessments and monitoring data (Swanson et al. 2006). Also conserve or enhance wet meadow complexes to maintain or increase amount of edge and cover near that edge to minimize elevated mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010) as observed throughout the reach of the stream/watershed and not on specific sites. Some defined areas of concentrated use may be necessary to protect and enhance the overall riparian area.	period (Hagen et al. 2007; Kolada et al. 2009; Atamian et al. 2010).	
Action A-LG 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 12: Where riparian areas and wet meadows meet PFC or meet standards using other similar methodology (Forest Service only), strive to attain reference state vegetation relative to the ecological site description.	Action C-LG 12: —	Action D-LG 12: —	Action E-LG 12: Grazing management strategies for riparian areas and wet meadows should, at a minimum, maintain or achieve riparian PFC and promote brood rearing/ summer habitat objectives as described in Table 2-2 within Greater Sage-Grouse habitat.	Action F-LG 12: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				Within Greater Sage-Grouse habitat, manage wet meadows to maintain a component of available perennial forbs with diverse species richness to facilitate brood rearing and stabilizing riparian species (Burton et al. 2011) near where water flows to achieve or maintain PFC. Use ESDs or locally relevant information about soils, hydrology, soil moisture, and site potential to set realistic objectives and evaluate assessments and monitoring data (Swanson et al. 2006). Also conserve or enhance wet meadow complexes to maintain or increase amount of edge and cover near that edge to minimize elevated mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010).		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 13: Within PHMA, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by Greater Sage-Grouse in the hot season (summer) (Aldridge and Brigham 2002; Crawford et al. 2004; Hagen et al. 2007).	Action C-LG 13: —	Action D-LG 13: In PHMA and GHMA, apply principles of prescriptive livestock grazing that control time and timing of grazing so that hot season use does not occur on an annual basis.	Action E-LG 13: Grazing management strategies for riparian areas and wet meadows should, at a minimum, maintain or achieve riparian Proper Functioning Condition (PFC) and promote brood rearing/summer habitat objectives, as described in Table 2-2, within Greater Sage-Grouse habitat. Within Greater Sage-Grouse habitat, manage wet meadows to maintain a component of available perennial forbs with diverse species richness to facilitate brood rearing and stabilizing riparian species (Burton et al. 2011) near where water flows to achieve or maintain PFC. Use Ecological Site Descriptions (ESDs) or locally relevant information about soils, hydrology, soil moisture, and site potential to set realistic objectives and evaluate assessments and monitoring data (Swanson et al. 2006). Also conserve or enhance wet meadow complexes to maintain or increase amount of edge and cover near that edge to minimize elevated	Action F-LG 13: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				mortality during the late brood rearing period (Hagen et al. 2007; Kolada et al. 2009a; Atamian et al. 2010) as observed throughout the reach of the stream/watershed and not on specific sites. Some defined areas of concentrated use may be necessary to protect and enhance the overall riparian area.		
Action A-LG 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 14: Authorize new water development for diversion from spring or seep source only when PHMA would benefit from the development. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve Greater Sage-Grouse habitat.	Action C-LG 14: —	Action D-LG 14: Authorize new water development for diversion from spring or seep source when PHMA and GHMA would benefit from the development.	Action E-LG 14: Authorize new water development for diversion from spring or seep sources only when Greater Sage-Grouse habitat would not be net negatively affected by the development. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve Greater Sage-Grouse habitat.	Action F-LG 14: Authorize no new water developments for diversion from spring or seep sources within Greater Sage-Grouse habitat.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 15: Analyze springs, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within PHMA. Make modifications where necessary, considering impacts on other water uses when such considerations are neutral or beneficial to Greater Sage-Grouse .	Action C-LG 15: —	Action D-LG 15: —	Action E-LG 15: Analyze springs, seeps and associated pipelines to find mutually beneficial opportunities to restore functionality to riparian areas within Greater Sage-Grouse habitat, and allow those opportunities to be developed.	Action F-LG 15: Analyze springs, seeps and associated water developments to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within Greater Sage-Grouse habitats. Make modifications where necessary, including dismantling water developments.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 16: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 16: In PHMA, only allow treatments that conserve, enhance or restore Greater Sage-Grouse habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve Greater Sage-Grouse habitat).	Action C-LG 16: —	Action D-LG 16: Unless targeted grazing is the preferred treatment, livestock grazing would not be authorized within treatment areas during implementation of each treatment. Any livestock grazing closure for the purpose of a vegetation treatment would be done through the grazing decision prior to treatment. Livestock grazing would be authorized to resume within a treatment project area after resource monitoring data verifies the treatment objectives are being met and an appropriate grazing regime has been developed.	Action E-LG 16: In Greater Sage-Grouse habitat, encourage and allow vegetation treatments that conserve, enhance or adaptively restore resilience and resistance over time. This includes adaptive management as part of an AMP/Conservation Plan to improve Greater Sage-Grouse habitat.	Action F-LG 16: Ensure that vegetation treatments create landscape patterns which most benefit Greater Sage-Grouse . Only allow treatments that are demonstrated to benefit Greater Sage-Grouse and retain sagebrush height and cover consistent with Greater Sage-Grouse habitat objectives (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve Greater Sage-Grouse habitat).	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 17: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 17: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to PHMA to determine if they should be restored to sagebrush or habitat of higher quality for Greater Sage-Grouse . If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving or enhancing the rest of the PHMA, then no restoration would be necessary. Assess the compatibility of these seedings for Greater Sage-Grouse habitat or as a component of a grazing system during the land health assessments (or other analyses [Forest Service only]) (Davies et al. 2011).	Action C-LG 17: —	Action D-LG 17: —	Action E-LG 17: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to Greater Sage-Grouse habitat to determine if additional efforts should be made to restore sagebrush or habitat of a higher quality for Greater Sage-Grouse . If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving, enhancing, or protecting the rest of the Greater Sage-Grouse habitat, then no restoration may be necessary. Assess the compatibility of these seedings for Greater Sage-Grouse habitat or as a component of a grazing system during the land health assessments (Davies et al. 2011) (or other analyses such as the Humboldt-Toiyabe Resource Implementation Protocol for Rapid Assessment Matrices (Forest Service - HTNF 2007)	Action F-LG 17: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to Greater Sage-Grouse habitat to determine if they should be restored to sagebrush or habitat of higher quality for Greater Sage-Grouse . If these seedings provide value in conserving or enhancing Greater Sage-Grouse habitats, then no restoration would be necessary. Assess the compatibility of these seedings for Greater Sage-Grouse habitat during the land health assessments.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 18: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 18: In PHMA, design any new structural range improvements and location of supplements (salt or protein blocks) to conserve, enhance, or restore Greater Sage-Grouse habitat through an improved grazing management system relative to Greater Sage-Grouse objectives. Structural range improvements, in this context, include but are not limited to: cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or increase following construction must be considered in the project planning process and monitored and treated post-construction.	Action C-LG 18: Livestock infrastructure, including fences, spring developments, pipelines, stock ponds and other harmful facilities will be removed (active restoration).	Action D-LG 18: In PHMA and GHMA, assess and modify as needed existing structural range developments to make sure they conserve, enhance, or restore Greater Sage-Grouse habitat.	Action E-LG 18: In Greater Sage-Grouse habitat, ensure that the design of any new structural range improvements and plan the location of supplements (salt or protein blocks) enhance Greater Sage-Grouse habitat or minimize impacts and to promote Greater Sage-Grouse objectives (see Table 2-2). Structural range improvements, in this context, include but are not limited to: cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or their increase following construction must be considered in the project plan and then monitored, treated, and rehabilitated post-construction.	Action F-LG 18: Avoid all new structural range developments in PHMA and GHMA unless independent peer-reviewed studies show that the range improvement structure benefits Greater Sage-Grouse . Structural range developments, in this context, include but are not limited to cattle guards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or increase following construction must be considered in	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
					the project planning process and monitored and treated post-construction. Consider the comparative cost of changing grazing management instead of constructing additional range developments.	
Action A-LG 19: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 19: When developing or modifying water developments in PHMA, use applicable RDFs consistent with applicable law (see Appendix C of NTT report) to mitigate potential impacts from West Nile virus (Clark et al. 2006; Doherty 2007; Walker et al. 2007; Walker and Naugle 2011).	Action C-LG 19: —	Action D-LG 19: Modify existing water development projects as needed or feasible to ensure riparian habitats in PHMA and GHMA are being maintained or improved.	Action E-LG 19: —	Action F-LG 19: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 20: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 20: In PHMA, evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore Greater Sage-Grouse habitat.	Action C-LG 20: —	Action D-LG 20: Salting and supplemental feeding locations, livestock watering and handling facilities (e.g., corrals and chutes) would be located at least 0.5-mile from riparian zones, springs, and meadows, or active leks in PHMA and GHMA. The distance can be greater based on local conditions.	Action E-LG 20: Salting and supplemental feeding locations, temporary and/or mobile watering and new handling facilities (e.g., corrals and chutes) would be located at least 1/2-mile from riparian zones, springs, meadows, or 1 mile from active leks in Greater Sage-Grouse habitat, unless the pasture is too small or another location offers equal or better habitat benefits. The distance should be based on local conditions.	Action F-LG 20: Same as Alternative B.	
Action A-LG 21: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 21: To reduce outright Greater Sage-Grouse strikes and mortality, remove, modify or mark fences in high risk areas within PHMA based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011).	Action C-LG 21: —	Action D-LG 21: Remove, modify, or mark permanent and/or temporary fences in areas of high risk for bird strikes within PHMA and GHMA. Permanent and/or temporary fences would not be located on or across active Greater Sage-Grouse leks. Remove and re-locate existing fences that are located on or across Greater Sage-Grouse active leks.	Action E-LG 21: To reduce Greater Sage-Grouse strikes and mortality, remove, modify or mark fences in high risk areas within Greater Sage-Grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011). Consideration of the utility of the fence should also be taken into consideration to ensure that its removal does not promote degradation of the overall management for habitat or other objectives (Swanson et al. 2006).	Action F-LG 21: Remove, modify or mark fences in areas of moderate or high risk of Greater Sage-Grouse strikes within Greater Sage-Grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011).	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 22: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 22: In PHMA, monitor for, and treat invasive species associated with existing range improvements (Gelbard and Belnap 2003; Bergquist et al. 2007).	Action C-LG 22: —	Action D-LG 22: —	Action E-LG 22: In Greater Sage-Grouse habitat, monitor, treat and if necessary, rehabilitate sites with invasive species associated with existing range improvements (Gelbard and Belnap 2003; Bergquist et al. 2007). State listed noxious weeds (NRS 555) should be given the highest priority. In general, monitor, map, treat (using IPM and associated tools), and rehabilitate sites that have invasive and noxious weed species, especially those associated with disturbance activities.	Action F-LG 22: Same as Alternative B.	
Action A-LG 23: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 23: Maintain retirement of grazing privileges as an option in priority Greater Sage-Grouse areas when the current permittee is willing to retire grazing on all or part of an allotment. Analyze the adverse impacts of no livestock use on wildfire and invasive species threats (Crawford et al. 2004) in evaluating retirement proposals.	Action C-LG 23: —	Action D-LG 23: Consider retirement of grazing privileges on all voluntary relinquishments in PHMA and GHMA where removal of livestock grazing would enhance the ability to achieve Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Action E-LG 23: All permit relinquishments should be voluntary. All options to allow responsible management of livestock grazing on an allotment should be considered before any voluntary withdrawal of a grazing permit is considered, in conformance with the multiple use sections of the Taylor Grazing Act.	Action F-LG 23: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 24: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 24: —	Action C-LG 24: —	Action D-LG 24: Establish vegetation treatment project monitoring sites prior to project implementation. Measure project monitoring sites annually during the livestock grazing closure period.	Action E-LG 24: Prior to implementation, establish project monitoring sites where vegetation treatment is planned and monitor at least annually during the recovery period. To ensure effective recovery, monitoring should continue for a number of years immediately following the livestock exclusion period, depending on local site conditions. To reduce the risk of fire and enhance restoration in large contiguous blocks of cheatgrass-dominated sagebrush or Greater Sage-Grouse habitats that are next to highly flammable cheatgrass dominated lands, create local NEPA documented plans to use, e.g. dormant season temporary nonrenewable (TNR) AUM authorizations and stewardship contracted grazing to reduce fuels in areas dominated by invasive plants (Schmelzer et al., in press). Use adaptive management to allow the use of TNR during other seasons, if science emerges	Action F-LG 24: Any vegetation treatment plan must include pretreatment data on wildlife and habitat condition, establish nongrazing exclosures, and include long-term monitoring where treated areas are monitored for at least three years before grazing returns. Continue monitoring for five years after livestock are returned to the area, and compare to treated, ungrazed exclosures, as well as untreated areas.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				demonstrating effectiveness of such practices. Planning should be conducted on an allotment specific basis, and may be contained in allotment management plans (AMPs), multiple use decisions, or permit renewals.		
Action A-LG 25: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 25: —	Action C-LG 25: —	Action D-LG 25: Within PHMA and GHMA, incorporate terms and conditions into grazing permits to meet Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Action E-LG 25: Continue land health assessments on BLM public lands or other monitoring methods on Forest Service-administered lands in Greater Sage-Grouse habitat to evaluate current conditions as compared to Greater Sage-Grouse habitat objectives described in Table 2-2. Incorporate the results of BLM and Forest Service monitoring and land health assessments into future management applications to ensure progress toward meeting Greater Sage-Grouse habitat objectives. Incorporate terms and conditions into grazing permits and adjust these as needed through monitoring and adaptive management to meet Greater Sage-Grouse habitat objectives.	Action F-LG 25: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 26: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 26: —	Action C-LG 26: —	Action D-LG 26: Grazing permit transfers would not be approved without review of Greater Sage-Grouse habitat conditions. Where Greater Sage-Grouse objectives (See Table 2-11 in section 2.8.5 of this Chapter) are not being met in an allotment and causal factors are attributable to livestock grazing, adjust the annual grazing authorization or operating instructions to reflect the allowable use levels (as identified in Table 2-12 in section 2.8.5 of this Chapter) prior to the next grazing season. The Habitat Assessment Framework will be the tool to determine the level to which standards are or not being met.	Action E-LG 26: The allotment should be meeting objectives or if not, changes should already be in place to make upwards trends possible. Waiting for a change of ownership and making changes is not consistent with the goals and objectives of this section or the state plan. (Refer to Action E LG8: in EIS)	Action F-LG 26: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 27: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 27: —	Action C-LG 27: —	Action D-LG 27: Utilize the Greater Sage-Grouse habitat assessment framework and adjust terms and conditions in the grazing permit renewal process where Greater Sage-Grouse objectives (See Table 2-11 in section 2.8.5 of this Chapter) are not being met in an allotment and causes are attributable to livestock grazing. Where habitat conditions (as defined in Table 2-11 in section 2.8.5 of this Chapter)are not being met, and causal factors are attributable to livestock grazing, adjust the annual grazing authorization or operating instructions to reflect the allowable use levels (as identified in Table 2-12 in section 2.8.5 of this Chapter) prior to the next grazing season. The Habitat Assessment Framework will be the tool to determine the level to which standards are or not being met.	Action E-LG 27: TMA-12: Ensure that existing grazing permits maintain or enhance habitat in the SGMA. Utilize livestock grazing when appropriate as a management tool to improve Greater Sage-Grouse habitat quantity, quality or to reduce wildfire threats. Based on a comprehensive understanding of seasonal Greater Sage-Grouse habitat requirements, and in conjunction with flexibility of livestock operators, encourage land management agencies to cooperatively make timely, seasonal range management decisions to respond to vegetation management objectives, including fuels reduction.	Action F-LG 27: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 28: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 28: —	Action C-LG 28: —	Action D-LG 28: Under appropriate conditions implement *Drought Policy* (BLM 2011c) to protect Greater Sage-Grouse PHMA and GHMA. Implement post-drought management to allow for vegetation recovery that meets Greater Sage-Grouse life cycle needs in PHMA and GHMA.	Action E-LG 28: When conditions, i.e., climatic variations (such as drought) and wildfire, requiring unique or exceptional management, work to protect Greater Sage-Grouse habitat on a case by case basis and implement adaptive management to allow for vegetation recovery that meets resistance, resilience, and Greater Sage-Grouse life cycle needs in Greater Sage-Grouse habitat as needed on an individual allotment basis.	Action F-LG 28: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 29: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 29: —	Action C-LG 29: —	Action D-LG 29: During the annual grazing application, work with permittees to avoid concentrated turn-out locations for livestock within approximately 3 miles of known lek areas during the March 1 to May 15 period. Avoid domestic sheep use and bedding areas, and herder camps within at least 1.24 miles (2 kilometers) of known lek locations. Utilize land features and roads on maps provided to the permittee to help demarcate livestock use avoidance areas. Require terms and conditions language for affected livestock grazing permits regarding livestock use during the lekking period.	Action E-LG 29: During the annual grazing application, work with permittees to avoid consistent concentrated turn-out locations for livestock within approximately 3 miles of known lek areas during the March 1 to May 15 period. During the March 1 to May 15 period, avoid domestic sheep use, bedding areas, and herder camps within at least 1.24 miles (2 kilometers) of known lek locations. Utilize land features and roads on maps provided to the permittee to help demarcate livestock use avoidance areas. Require terms and conditions language for affected livestock grazing permits regarding livestock turnout locations during the lekking period. During the lekking period, use best management practices to avoid livestock aggregation around the lekking grounds.	Action F-LG 29: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 30: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 30: —	Action C-LG 30: —	Action D-LG 30: During the permit renewal process, include terms and conditions language regarding livestock use during the lekking period.	Action E-LG 30: Strive to improve and maintain regular communication at the allotment level between land management agency and the permittee to encourage proper management techniques. Land management agencies should coordinate with relevant state, local and tribal government agencies and permittees to conduct regular trend monitoring at the allotment level. Encourage cooperative permittee monitoring, such as described in Perryman et al 2006.	Action F-LG 30: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 31: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 31: —	Action C-LG 31: —	Action D-LG 31: —	Action E-LG 31: Ensure that existing grazing permits maintain or enhance habitat within the SGMA. Utilize livestock grazing when appropriate as a management tool to improve Greater Sage-Grouse habitat quantity, quality or to reduce wildfire threats. Based on a comprehensive understanding of seasonal Greater Sage-Grouse habitat requirements, and in conjunction with flexibility of livestock operators, encourage land management agencies to cooperatively make timely, seasonal range management decisions to respond to vegetation management objectives, including fuels reduction.	Action F-LG 31: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 32: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 32: —	Action C-LG 32: —	Action D-LG 32: —	Action E-LG 32: Promote and implement proper livestock grazing practices that promote the health of the perennial herbaceous vegetation component. Perennial grasses, especially, are strong competitors with cheatgrass (Booth et al. 2003; Chambers et al. 2007; Davies et al. 2008; Blank and Morgan 2012). Field research has demonstrated that moderate levels of livestock grazing can increase the resiliency of sagebrush communities, reduce the risk and severity of wildfire, and decrease the risk of exotic weed invasion (Davies et al. 2009 and Davies et al. 2010).	Action F-LG 32: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LG 33: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 33: —	Action C-LG 33: —	Action D-LG 33: —	Action E-LG 33: Grazing management strategies for riparian areas should, at a minimum, maintain or achieve riparian PFC. Specific management actions include riparian fencing to provide control of the season, duration or degree of herbivory, providing alternate water sources away from the riparian area, changing the grazing system, or other grazing management practices that promote herbage removal within acceptable limits.	Action F-LG 33: —	
Action A-LG 34: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG 34: —	Action C-LG 34: —	Action D-LG 34: —	Action E-LG 34: Identify and apply appropriate habitat management (e.g. livestock management and vegetation treatments), and all predator control practices (e.g. control of artificial nest and roost sites, increased take, and decrease anthropogenic subsidies) that decrease the effectiveness of predators.	Action F-LG 34: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Climate Change						
Action A-LG-CC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG-CC 1: —	Action C-LG-CC 1: —	Action D-LG-CC 1: As climate change data become available through REAs or other ecological studies, identify areas of unfragmented Greater Sage-Grouse habitat and key habitat linkages that provide the life-cycle and genetic transfer needs for Greater Sage-Grouse . Manage the identified areas as PHMA.	Action E-LG-CC 1: To aid in planning adaptive management for the purpose of maintaining health of important forage plants (perennials needed for resilience and resistance), cooperatively strategize how various areas in Greater Sage-Grouse habitat allotments can be managed differently each year to achieve positive grazing response index scores (Perryman et al 2006; Reed et al. 1999; Wyman et al. 2006; and USDA FOREST SERVICE 1996) and meet resource objectives.	Action F-LG-CC 1: —	
Action A-LG-CC 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG-CC 2: —	Action C-LG-CC 2: —	Action D-LG-CC 2: Work cooperatively with multiple agencies and stakeholders to establish and maintain a network of climate monitoring sites and stations.	Action E-LG-CC 2: —	Action F-LG-CC 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Drought						
Action A-LG-D 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LG-D 1: —	Action C-LG-D 1: —	Action D-LG-D 1: Due to drought conditions, changes in livestock management may be required to protect PHMA. The Field Manager or the Forest Service District Ranger should encourage permittees to take voluntary measures to delay turnout, reduce numbers, and adjust livestock operations. Absent voluntary measures to change livestock management by permittees, the District Manager or Forest Service District Ranger would implement appropriate changes to livestock grazing through decision or Annual Operating Instructions	Action E-LG-D 1: When conditions, i.e., climatic variations (such as drought) and wildfire, requiring unique or exceptional management, work to protect Greater Sage-Grouse habitat on a case by case basis and implement adaptive management to allow for vegetation recovery that meets resistance, resilience, and Greater Sage-Grouse life cycle needs in Greater Sage-Grouse habitat as needed on an individual allotment basis.	Action F-LG-D 1: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Recreation and Visitor Services						
No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-REC 1: Only allow BLM SRPs and Forest Service Recreation Special Use Authorizations (RSUAs) in PHMA that have neutral or beneficial effects on PHMA.	Action C-REC 1: Same as Alternative A.	Action D-REC 1: Allow SRPs and Forest Service Recreation Special Use Authorization (RSUA) in PHMA and GHMA that have neutral or beneficial effects on Greater Sage-Grouse .	Action E-REC 1: All new proposed SRPs and Forest Service Recreation Special Use Authorizations (RSUA) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-REC 1: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-REC 2: —	Action C-REC 2: Same as Alternative A.	Action D-REC 2: No new recreation facilities would be constructed in PHMA and GHMA (e.g. Campgrounds, day-use areas, scenic pullouts, and trailheads).	Action D-REC 2: All proposed new recreation facilities (e.g. campgrounds, day-use areas, scenic pullouts, and trailheads) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-REC 2: Seasonally prohibit camping and other nonmotorized recreation within 4 miles of active Greater Sage-Grouse leks.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-REC 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-REC 3: —	Action C-REC 3: —	Action D-REC 3: —	Action E-REC 3: In the SGMA, continue successful programs following the avoid, minimize, and mitigate strategy for recreation and OHV impacts on Greater Sage-Grouse habitat.	Action F-REC 3: —	
Action A-REC 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-REC 4: —	Action C-REC 4: —	Action D-REC 4: —	Action E-REC 4: Study the impact caused by recreational and OHV use in Greater Sage-Grouse habitat.	Action F-REC 4: —	
Action A-REC 5: —	Action B-REC 5: —	Action C-REC 5: —	Action D-REC 5: —	Action E-REC 5: Work collaboratively through LAWGs, State, and Federal agencies to designate OHV areas outside of the SGMA.	Action F-REC 5: —	
Comprehensive Travel and Transportation Management						
Action A-CTTM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 1: In PHMA, limit motorized travel to existing roads, primitive roads, and trails at a minimum, until such time as travel management planning is complete and routes are either designated or closed.	Action C-CTTM 1: Motorized travel would be limited to existing roads, primitive roads, and trails in PHMA.	Action D-CTTM 1: In plans that have been completed and are being implemented (e.g., Northeastern California and Forest Service plans), motorized travel would be limited to designated routes in PHMA and GHMA. In areas where travel planning has not been completed, motorized travel would be limited to existing routes in PHMA and GHMA.	Action E-CTTM 1: In Core and Priority habitat limit motorized travel to existing roads, primitive roads, and trails at a minimum, until such time as travel management planning is complete and routes are either designated or closed.	Action F-CTTM 1: Same as Alternative D.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-CTTM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 2: —	Action C-CTTM 2: —	Action D-CTTM 2: —	Action E-CTTM 2: Work collaboratively through LAWGs, State, and Federal agencies to designate OHV areas outside of the SGMA.	Action F-CTTM 2: —	
Action A-CTTM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 3: —	Action C-CTTM 3: Same as Alternative A.	Action D-CTTM 3: —	Action E-CTTM 3: Design roads to an appropriate standard, no higher than necessary, to accommodate their intended purpose and level of use (see Appendix O [of the 2015 Final EIS]).	Action F-CTTM 3: Prohibit new road construction within 4 miles of active Greater Sage-Grouse leks, and avoid new road construction in PHMA and GHMA.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-CTTM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 4: In PHMA, travel management should evaluate the need for permanent or seasonal road or area closures.	Action C-CTTM 4: Some roads that intrude into lek or winter habitats will be removed or seasonally closed.	Action D-CTTM 4: In PHMA and GHMA, new travel management plans would evaluate vehicle routes and determine the need for permanent or seasonal road closures, and mode of travel (e.g. motorcycle, ATV, and UTV) restrictions, including noise levels and speed. Where such closures or restrictions are infeasible due to administrative or public need, consider re-routing road to improve or protect Greater Sage-Grouse habitat. Periods of seasonal road closures would be identified in the travel management plan taking into account the adverse effect on the particular life-cycle need of Greater Sage-Grouse in the area of the seasonal closure. Routes in PHMA not required for public access or recreation with current administrative/agency purpose or need should be evaluate for administrative access only in the implementation-level transportation management plans.	Action E-CTTM 4: —	Action F-CTTM 4: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-CTTM 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 5: Complete activity level travel plans within five years of the ROD. During activity level planning, where appropriate, designate routes in PHMA with current administrative/agency purpose or need to administrative access only.	Action C-CTTM 5: Same as Alternative A.	Action D-CTTM 5: Same as Alternative A.	Action E-CTTM 5: TMA-8.1: Follow a strategy that seeks to avoid conflict with Greater Sage-Grouse by locating facilities and activities in Non-Habitat wherever possible (State of Nevada 2012).	Action F-CTTM 5: Same as Alternative B.	
Action A-CTTM 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 6: In PHMA, limit route construction to realignments of existing designated routes if that realignment has a minimal impact on Greater Sage-Grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety.	Action C-CTTM 6: Same as Alternative A.	Action D-CTTM 6: In PHMA and GHMA, no new roads would be allowed except those necessary for public safety, administrative or public need to accommodate valid existing rights. Limit route construction to realignments of existing routes if the realignment: 1) maintains or enhances PHMA, 2) eliminates the need to construct a new road, or 3) is necessary for public safety, 4) Minimize impacts on Greater Sage-Grouse habitat through application of RDFs consistent with	Action E-CTTM 6: All proposed new roads within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the	Action F-CTTM 6: Limit route construction to realignments of existing designated routes if that realignment has a minimal impact on Greater Sage-Grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety. Mitigate any impacts with methods that have been demonstrated to be effective to offset the loss of Greater Sage-Grouse habitat.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			applicable law (see Appendix D [of the 2015 Final EIS]) and other mitigation measures.	2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).		
Action A-CTTM 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 7: In PHMA, use existing roads, or realignments as described above to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3 % for that area, then evaluate and implement additional, effective mitigation necessary to offset the resulting loss of Greater Sage-Grouse habitat (see Objectives).	Action C-CTTM 7: Same as Alternative A.	Action D-CTTM 7: In PHMA and GHMA, access to valid existing rights would be addressed to provide the minimum access necessary to exercise the right and maintain or enhance Greater Sage-Grouse habitat through mitigation necessary to off-set loss to PHMA.	Action D-CTTM 7: All proposed new anthropogenic disturbances, including those necessary to access valid existing rights, within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts	Action F-CTTM 7: Same as Alternative B using a 4-mile buffer from leks to determine road route.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F
				through the Conservation Credit System (see Action E-SSS-ACDM 5).	
Action A-CTTM 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 8: In PHMA, allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on Greater Sage-Grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.	Action C-CTTM 8: Same as Alternative A.	Action D-CTTM 8: In PHMA and GHMA, allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrade would maintain or enhance Greater Sage-Grouse habitat, provide a fuel break to protect native vegetation, is necessary for public safety, or eliminates the need to construct a new road.	Action E-CTTM 8: All proposed upgrades of existing routes, including those which would change route category (road, primitive road, or trail) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-CTTM 8: Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless it is necessary for motorist safety, or eliminates the need to construct a new road. Any impacts shall be mitigated with methods that have been demonstrated to be effective to offset the loss of Greater Sage-Grouse habitat.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-CTTM 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 9: In PHMA, conduct restoration of roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in WSAs and within lands with wilderness characteristics that have been selected for protection in previous LUPs.	Action C-CTTM 9: Same as Alternative A.	Action D-CTTM 9: In PHMA and GHMA, close primitive roads and trails not designated in travel management plans so they are effectively closed to motorized travel.	Action E-CTTM 9: Conduct rehabilitation of roads, primitive roads, and trails not designated in travel management plans where such plans exist and have been approved for implementation. This also includes primitive route/roads that were not designated in wilderness study areas and within lands managed for wilderness characteristics that have been selected for protection, with due consideration given to any historical significance of existing trails. (See Appendix D [of the 2015 Final EIS])	Action F-CTTM 9: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-CTTM 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-CTTM 10: When reseeding roads, primitive roads and trails in PHMA, use appropriate seed mixes and consider the use of transplanted sagebrush.	Action C-CTTM 10: Same as Alternative A.	Action D-CTTM 10: In PHMA and GHMA, obliterate and seed roads, primitive roads and trails not designated in travel management plans, with appropriate seed mixes and transplanted sagebrush when applicable. Use fire resistant species to provide for fire breaks where appropriate. Seed must be certified weed-free.	Action E-CCTM 10: When reseeding roads, primitive roads, and trails, use appropriate seed mixes and consider the use of transplanted sagebrush in order to meet Greater Sage-Grouse habitat restoration objectives. Where invasive annual grasses are present, herbicides may be used to enhance the effectiveness of any seeding and to also establish islands of desirable species for dispersion. (See Appendix D [of the 2015 Final EIS])	Action F-CTTM 10: When reseeding closed roads, primitive roads and trails, use appropriate native seed mixes and require the use of transplanted sagebrush.	
Lands and Realty						
Land Use Authorizations						
Action A-LR-LUA 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 1: Make PHMA exclusion areas for new BLM ROW or Forest Service Special Use Authorization (SUA) permits. Consider the following exceptions: • Within designated ROW or SUA corridors encumbered by existing ROW or SUA: new ROWs or SUAs may be co-located only if the entire footprint of	Action C-LR-LUA 1: Make PHMA ROW exclusion areas including new ROWs within corridors New corridors/facilities will be sited in nonhabitat and bundled with existing corridors to the maximum extent possible.	Action D-LR-LUA 1: Designate PHMA as ROW avoidance areas for all other ROWs or SUAs. Development within avoidance areas could occur if the development incorporates appropriate RDFs, consistent with applicable law, in design and construction (e.g. noise, tall structure, and seasonal restrictions) and development results in no net un-mitigated loss of PHMA and GHMA.	Action E-LR-LUA 1: All proposed ROWs and SUAs within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management	Action F-LR-LUA 1: PHMA and GHMA shall be exclusion areas for new ROWs permits. Consider the following exceptions: • Within designated ROW corridors encumbered by existing ROW authorizations: new ROWs may be co-located only if the entire footprint of the	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	the proposed project (including construction and staging), can be completed within the existing disturbance associated with the authorized ROWs or SUAs. • Subject to valid existing rights: where new ROWs or SUAs associated with valid existing rights are required, co-locate new ROWs or SUAs within existing ROWs or SUAs or where it best minimizes impacts on Greater Sage-Grouse . Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If		Subject to valid, existing rights: where new ROWs or SUAs associated with valid existing rights are required, co-locate new ROWs or SUAs within existing ROWs or SUAs to achieve no net un-mitigated loss of PHMA.	category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5). This is similar to designation as ROW avoidance areas. Site new linear features in existing corridors or, at a minimum, co-locate with existing linear features in the SGMA.	proposed project (including construction and staging); can be completed within the existing disturbance associated with the authorized ROWs. • Subject to valid, existing rights: where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes Impacts on Greater Sage-Grouse . Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	that disturbance exceeds 3% for that area, then evaluate and implement additional effective mitigation on a case-by-case basis to offset the resulting loss of Greater Sage-Grouse habitat.				the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then make additional mitigation that has been demonstrated to be effective to offset the resulting loss of Greater Sage-Grouse habitat.	
Action A-LR-LUA 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 2: Evaluate and take advantage of opportunities to remove, bury, or modify existing power lines within PHMA.	Action C-LR-LUA 2: Same as Alternative A.	Action D-LR-LUA 2: Where appropriate, bury new and existing utility lines as mitigation unless not technically feasible.	Action E-LR-LUA 2: Bury distribution power lines of up to 35kV where ground disturbance can be minimized. Where technology and economic factors allow, bury higher kV power lines. (See Appendix D [of the 2015 Final EIS]).	Action F-LR-LUA 2: Same as Alternative B	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 3: Where existing leases or ROWs or SUAs have had some level of development (e.g., road, fence, or well) and are no longer in use, reclaim the site by removing these features and restoring the habitat.	Action C-LR-LUA 3: Same as Alternative A.	Action D-LR-LUA 3: In PHMA and GHMA where existing ROWs or SUAs are no longer in use, coordinate with the lease holder or Forest Service Special Use Permit holder to relinquish the ROW or SUA and reclaim the site by removing overhead lines and other infrastructure.	Action E-LR-LUA 3: Where existing leases or rights-of-way (ROWs) have had some level of development (e.g., road, fence, or well) and are no longer in use, reclaim the site by removing these features, without interfering with valid pre-existing rights, and restoring the habitat. (See Appendix D [of the 2015 Final EIS]).	Action F-LR-LUA 3: Same as Alternative B	
Action A-LR-LUA 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 4: Planning Direction Note: Relocate existing designated ROW corridors crossing PHMA void of any authorized ROWs, outside of the PHMA. If relocation is not possible, undesignate that entire corridor during the planning process.	Action C-LR-LUA 4: Same as Alternative A.	Action D-LR-LUA 4: —	Action E-LR-LUA 4: —	Action F-LR-LUA 4: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 5: Make GHMA "avoidance areas" for new ROWs or SUAs.	Action C-LR-LUA 5: See Action C-LR-LUA 1.	Action D-LR-LUA 5: Designate GHMA as ROW avoidance areas for new communication site ROWs or SUAs. Development within avoidance areas could occur if the development incorporates appropriate RFDs in design and construction (e.g. noise, tall structure, and seasonal restrictions) and development results in no net un-mitigated loss of PHMA or GHMA.	Action E-LR-LUA 5: All proposed new communication site ROWs and SUAs within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5). This is similar to designation as ROW avoidance areas.	Action F-LR-LUA 5: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 6: Where new ROWs or SUAs are necessary in GHMA, co-locate new ROWs or SUAs within existing ROWs or SUAs where possible.	Action C-LR-LUA 6: Same as Alternative A.	Action D-LR-LUA 6: In PHMA and GHMA, co-locate new utility (e.g., power or telephone) lines with other existing linear surface ROWs, such as roads and pipelines.	Action E-LR-LUA 6: TMA-18.6: Site new linear features in existing corridors or, at a minimum, co-locating with existing linear features in the SGMA.	Action F-LR-LUA 6: —	
Action A-LR-LUA 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 7: —	Action C-LR-LUA 7: —	Action D-LR-LUA 7: Manage landfills and transfer stations on public lands to reduce opportunities for nesting, cover, or perches for predators. Identify and close trespass landfills and dumps on public lands.	Action E-LR-LUA 7: TMA-9.3: Continue successful programs that have eliminated external food sources for ravens, particularly landfills, waste transfer facilities, and road kill that subsidize raven populations. Enforce existing State laws that require daily covering of landfills. Continue to reduce and minimize external food sources for ravens: particularly landfills, waste transfer facilities, and road kill that subsidize raven populations.	Action F-LR-LUA 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 8: —	Action C-LR-LUA 8: —	Action D-LR-LUA 8: —	Action E-LR-LUA 8: The Nevada Sagebrush Ecosystem Council and the Nevada Sagebrush Ecosystem Technical Team will meet energy goals and Greater Sage-Grouse conservation measures through close coordination with all interest groups and adherence to NRS 701.610 (amended by the 2011 Nevada Legislature) that requires state agency review of all energy development proposals. Attention will be focused on the series of transmission corridors currently being studied to consider the longer term transmission needs required to meet the nation's renewable energy demands. On federal lands, activities that have an approved BLM notice, plan of operation, ROW, or drilling plan, and on State/Private lands, projects with an approved Nevada Division of Environmental Protection permit, are exempt from any new mitigation requirements above and beyond what has already	Action F-LR-LUA 8: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				been stipulated in the projects' approvals.		
Action A-LR-LUA 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 9: —	Action C-LR-LUA 9: —	Action D-LR-LUA 9: —	Action E-LR-LUA 9: Follow a strategy that seeks to avoid conflict with Greater Sage-Grouse by locating facilities and activities in Non-Habitat wherever possible.	Action F-LR-LUA 9: —	
Action A-LR-LUA 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 10: —	Action C-LR-LUA 10: —	Action D-LR-LUA 10: —	Action E-LR-LUA 10: In the SGMA, limit conflict through avoidance and minimization of impacts, adaptive management, and appropriate mitigation	Action F-LR-LUA 10: —	
Action A-LR-LUA 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 11: —	Action C-LR-LUA 11: —	Action D-LR-LUA 11: —	Action E-LR-LUA 11: Energy developers will work closely with state and federal agency experts to determine important nesting, brood rearing and winter habitats and avoid those areas.	Action F-LR-LUA 11: —	
Action A-LR-LUA 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 12: —	Action C-LR-LUA 12: —	Action D-LR-LUA 12: —	Action E-LR-LUA 12: A company representative will provide environmental training to on-site personnel and be responsible for overseeing compliance with all protective measures and coordination in accordance with the permitting authority.	Action F-LR-LUA 12: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 13: —	Action C-LR-LUA 13: —	Action D-LR-LUA 13: —	Action E-LR-LUA 13: Vehicle trips shall be limited to those times that least impact nesting or wintering Greater Sage-Grouse .	Action F-LR-LUA 13: —	
Action A-LR-LUA 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 14: —	Action C-LR-LUA 14: —	Action D-LR-LUA 14: —	Action E-LR-LUA 14: Current transmission and generation siting and construction practices to be reviewed and potentially refined by the Nevada Sagebrush Ecosystem Council and Nevada Sagebrush Ecosystem Technical Team pursuant to the "Resource Selection Function Model" (Coates) and other best available science include proximity to active leks and nesting habitat, relation to migratory and nonmigratory populations, and relation to movement corridors.	Action F-LR-LUA 14: —	
Action A-LR-LUA 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 15: —	Action C-LR-LUA 15: —	Action D-LR-LUA 15: Eliminate existing raven nesting opportunities created by anthropogenic development on public lands (e.g., remove infrastructure, power line, and communication facilities no longer in service).	Action E-LR-LUA 15: Remove power lines that traverse important Greater Sage-Grouse habitats when facilities being serviced are no longer in use or when projects are completed (see Appendix D [of the 2015 Final EIS]).	Action F-LR-LUA 15: —	.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 16: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LUA 16: —	Action C-LR- LUA 16: —	Action D-LR-LUA 16: In PHMA and GHMA, require ROW holders to retro-fit existing power lines and other utility structure with perch-deterring devices during ROW renewal process.	Action E-LR-LUA 16: Work with existing rights-of-way holders to encourage installation of perch guards on all poles where existing utility poles are located within 5 km (3.2 miles) of known leks (Coates et al. 2013) (see Appendix D [of the 2015 Final EIS]).	Action F-LR- LUA 16: —	
Action A-LR- LUA 17: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR- LUA 17: —	Action C-LR- LUA 17: —	Action D-LR-LUA 17: —	Action E-LR- LUA 17: Development or infrastructure features should not be placed within a 0.6 mile (1 km) radius around seeps, springs and wet meadows within identified brood rearing habitats wherever possible. These features can provide a competitive advantage for avian predators; therefore increasing Greater Sage-Grouse mortality during a period when birds may be susceptible.	Action F-LR- LUA 17: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR- LUA 18: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR- LUA 18: —	Action C-LR- LUA 18: —	Action D-LR-LUA 18: Do not designate new utility corridors in PHMA and GHMA.	Action E-LR-LUA 18: Proposed new utility corridors within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR- LUA 18: —	
Action A-LR-LUA 19: —	Action B-LR-LUA 19: —	Action C-LR-LUA 19: —	Action D-LR-LUA 19: —	Action E-LR-LUA 19: Aggressively engage in reclamation/weed control efforts during pre-and post-project construction.	Action F-LR-LUA 19: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LUA 20: —	Action B-LR-LUA 20: —	Action C-LR-LUA 20: —	Action D-LR-LUA 20: —	Action E-LR-LUA 20: Apply measures to deter raptor perching and raven nesting on elevated structures	Action F-LR-LUA 20: —	
Land Tenure						
Action A-LR-LT 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LT 1: Retain public ownership of PHMA. Consider exceptions where: • There is mixed ownership, and land exchanges would allow for additional or more contiguous federal ownership patterns within the PHMA. Under PHMA with minority federal ownership, include an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure consideration should be given to pursuing a permanent conservation easement.	Action C-LR-LT 1: All public lands in ACECs, PHMA, and identified restoration and rehab land areas will be retained in public ownership.	Action D-LR-LT 1: Retain public ownership of PHMA and GHMA. Consider exceptions when: • Disposal and/or acquisitions of public lands would allow for more contiguous federal ownership patterns within the Greater Sage-Grouse habitat area, or where a land tenure adjustment would result in a net gain in amount or quality of Greater Sage-Grouse habitat.	Action E-LR-LT 1: —	Action F-LR-LT 1: Same as Alternative B, without exceptions for disposal to consolidate ownership that would be beneficial to Greater Sage-Grouse .	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-LT 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-LT 2: Where suitable conservation actions cannot be achieved in PHMA, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase or exchange in order to best conserve, enhance or restore Greater Sage-Grouse habitat.	Action C-LR-LT 2: BLM and Forest Service will strive to acquire important private lands in BLM-designated ACECs and Forest Service Greater Sage-Grouse Special Areas. Acquisition will be prioritized over easements.	Action D-LR-LT 2: Where significant conservation actions could be achieved in PHMA, seek to acquire lands with intact subsurface mineral estate by donation, purchase, or exchange in order to best conserve, enhance or restore Greater Sage-Grouse habitat.	Action E-LR-LT 2: —	Action F-LR-LT 2: —	
Withdrawals						
Action A-LR-W 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 1: Propose lands within PHMA recommended for mineral withdrawal.	Action C-LR-W 1: Propose lands within PHMA recommended for mineral withdrawal.	Action D-LR-W 1: Same as Alternative A.	Action E-LR-W 1: —	Action F-LR-W 1: Same as Alternative B.	
Action A-LR-W 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 2: In PHMA, do not recommend withdrawal proposals not associated with mineral activity unless the land management is consistent with Greater Sage-Grouse conservation measures. (For example; in a proposed withdrawal for a military training range buffer area, manage the buffer area with Greater Sage-Grouse conservation measures.)	Action C-LR-W 2: Same as Alternative A.	Action D-LR-W 2: Same as Alternative A.	Action E-LR-W 2: —	Action F-LR-W 2: Do not approve withdrawal proposals not associated with mineral activity unless the land management is consistent with Greater Sage-Grouse conservation measures. (For example, in a proposed withdrawal for a military training range buffer area,	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
					manage the buffer area with Greater Sage-Grouse conservation measures that have been demonstrated to be effective.	
Action A-LR-W 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 3: —	Action C-LR-W 3: ROWs will be amended to require features that enhance Greater Sage-Grouse habitat security. Existing designated corridors in BLM ACECs and Forest Service Special Areas may be accessed for maintenance.	Action D-LR-W 3: —	Action E-LR-W 3: —	Action F-LR-W 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-W 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 4: —	Action C-LR-W 4: —	Action D-LR-W 4: In priority and general habitat, no new road ROWs would be authorized except those necessary for public safety or administrative or public need tied to valid existing rights. Limit route construction to realignments of existing ROWs if the realignment: 1) maintains or enhances priority Greater Sage-Grouse habitat, 2) eliminates the need to authorize a new ROW to construct a new road, or 3) is necessary for public safety, New ROW authorizations would be evaluated on a case-by-case basis. If new road construction is necessary, minimize impacts on Greater Sage-Grouse habitat through application of RDFs and other mitigation measures consistent with applicable law.	Action E-LR-W 4: All proposed new road ROWs within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-W 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-W 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 5: —	Action C-LR-W 5: —	Action D-LR-W 5: Within PHMA and GHMA, allow industrial coal-fired or natural gas-fired energy facilities associated with existing industrial infrastructure (e.g. a mine site) to provide on-site power generation.	Action E-LR-W 5: All proposed industrial coal-fired or natural-gas fired energy facilitates associated with existing infrastructure (e.g. a mine site) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-W 5: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-W 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-W 6: —	Action C-LR-W 6: —	Action D-LR-W 6: Lands that are acquired (exchange, purchase or easement) for Greater Sage-Grouse habitat, would be managed as PHMA.	Action E-LR-W 6: —	Action F-LR-W 6: —	
Wind Energy Development						
Action A-LR-WED 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-WED 1: Make PHMA exclusion areas for utility-scale commercial wind energy facilities. Make GHMA avoidance areas for utility-scale commercial wind energy facilities.	Action C-LR-WED 1: Make PHMA exclusion areas for utility-scale commercial wind energy facilities.	Action D-LR-WED 1: Designate PHMA and GHMA as ROW exclusion for utility-scale commercial wind energy facilities (facilities that generate large amounts of electricity that is delivered to many users through transmission and distribution systems).	Action E-LR-WED 1: All proposed utility-scale commercial wind energy facilities within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts	Action F-LR-WED 1: Do not site wind energy development in PHMA and GHMA (Jones 2012).	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				through the Conservation Credit System (see Action E-SSS-ACDM 5).		
Action A-LR-WED 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-WED 2: —	Action C-LR-WED 2: —	Action D-LR-WED 2: —	Action E-LR-WED 2: All proposed utility-scale commercial wind energy facilities within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-WED 2: Site wind energy development at least five miles from active Greater Sage-Grouse leks.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-WED 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-WED 3: —	Action C-LR-WED 3: —	Action D-LR-WED 3: Within PHMA and GHMA allow industrial wind facilities associated with existing industrial infrastructure (e.g. a mine site) to provide on-site power generation.	Action E-LR-WED 3: All proposed industrial wind energy facilities associated with existing industrial infrastructure (e.g. a mine site) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS] to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-WED 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Industrial Solar						
Action A-LR-IS 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-IS 1: — Designate PHMA and GHMA as ROW exclusion for utility-scale solar energy facilities on BLM land. Designate PHMA as open and GHMA as ROW avoidance for utility-scale solar energy facilities on Forest Service Lands.	Action C-LR-IS 1: Designate PHMA and ACECs as ROW exclusion for utility-scale solar energy facilities.	Action D-LR-IS 1: Designate PHMA and GHMA as ROW exclusion for utility-scale solar energy facilities.	Action E-LR-IS 1: All proposed utility-scale commercial solar energy facilities within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-IS 1: Designate PHMA and GHMA as ROW exclusion for utility-scale solar energy facilities.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LR-IS 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-IS 2: —	Action C-LR-IS 2: —	Action D-LR-IS 2: Within PHMA and GHMA, allow industrial solar energy facilities associated with existing industrial infrastructure (e.g. a mine site) to provide on-site power generation.	Action E-LR-IS 2: All proposed industrial solar energy facilities associated with existing infrastructure (e.g. a mine site) within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-LR-IS 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Urbanization						
Action A-LR-U 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LR-U 1: —	Action C-LR-U 1: —	Action D-LR-U 1: —	Action E-LR-U 1: TMA-20: When a county or city considers a change to its master plan for a land use of higher intensity affecting the SGMA, the county or city should consult with the Nevada Sagebrush Ecosystem Council through its Nevada Sagebrush Ecosystem Technical Team.	Action F-LR-U 1: —	
Leased Federal Fluid Mineral Estate						
Action A-FFME 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 1: In PHMA, apply actions through LUP implementation decisions (e.g., approval of an Application for Permit to Drill, and Sundry Notice) and upon completion of the environmental record of review (43 CFR 3162.5), including appropriate documentation of compliance with NEPA. In this process evaluate, among other things: 1. Whether the conservation measure is "reasonable" (43 CFR 3101.1-2) with the valid existing	Action C-FFME 1: Same as Alternative B.	Action D-FFME 1: —	Action E-FFME 1: —	Action F-FFME 1: Apply the following conservation measures as COAs at the project and well permitting stages, and through RMP implementation decisions and upon completion of the environmental record of review (43 CFR § 3162.5), including appropriate documentation of compliance with NEPA. In this process evaluate, among other things: 1. Whether the conservation	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	rights; and 2. Whether the action is in conformance with the approved LUP.				measure is "reasonable" (43 CFR § 3101.1-2) with the valid existing rights; and 2. Whether the action is in conformance with the approved RMP.	
Action A-FFME 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 2: In PHMA, provide the following conservation measures as terms and conditions of the approved LUP: Do not allow new surface occupancy on federal leases within PHMA, this includes winter concentration areas (Doherty et al. 2008; Carpenter et al. 2010) during any time of the year. Consider an exception: • If the lease is entirely within PHMA, apply a 4-mile NSO around the lek, and limit permitted disturbances to 1 per section with no more than 3% surface disturbance in that	Action C-FFME 2: Same as Alternative B.	Action D-FFME 2: —	Action E-FFME 2: All proposed surface disturbances on leased federal fluid mineral estates, within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features	Action F-FFME 2: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	section. • If the entire lease is within the 4-mile lek perimeter, limit permitted disturbances to 1 per section with no more than 3% surface disturbance in that section. Require any development to be placed at the most distal part of the lease from the lek, or, depending on topography and other habitat aspects, in an area that is less demonstrably harmful to Greater Sage-Grouse .			(see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).		

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFME 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 3: Apply a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and early brood-rearing season in all PHMA during this period.	Action C-FFME 3: Timing avoidance periods will be required.	Action D-FFME 3: Apply requisite seasonal restriction on exploratory drilling that prohibits surface-disturbing activities in winter habitat and during the lekking, nesting, and early brood-rearing season in all PHMA. See Appendix N [of the 2015 Final EIS], Leasable Mineral Stipulations, Waivers, Modifications, and Exceptions.	Action E-FFME 3: During the period specified, manage discretionary surface disturbing activities and uses to prevent disturbance to Greater Sage-Grouse during life cycle periods. Seasonal protection is identified for the following: -Seasonal protection within three (3) miles of active Greater Sage-Grouse leks from March 1 through June 15 during lekking hours of 1-hour before sunrise until 10:00 am -Seasonal protection of Greater Sage-Grouse suitable wintering areas from November 1 through March 31; -Seasonal protection of Greater Sage-Grouse suitable brood-rearing habitat from May 15 to August 15. (See Appendix D [of the 2015 Final EIS])	Action F-FFME 3: Apply a seasonal restriction on exploratory drilling that prohibits surface-disturbing activities during the nesting and brood-rearing season in all PHMA and GHMA during this period. This seasonal restriction shall also to apply to related activities that are disruptive to Greater Sage-Grouse , including vehicle traffic and other human presence.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFME 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 4: BLM should closely examine the applicability of categorical exclusions in PHMA. If extraordinary circumstances review is applicable, BLM should determine whether those circumstances exist.	Action C-FFME 4: Same as Alternative B.	Action D-FFME 4: —	Action E-FFME 4: —	Action F-FFME 4: Same as Alternative B.	
Action A-FFME 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 5: Complete Master Development Plans in lieu of APD-by-APD processing for all but wildcat wells.	Action C-FFME 5: Same as Alternative B.	Action D-FFME 5: —	Action E-FFME 5: —	Action F-FFME 5: Same as Alternative B.	
Action A-FFME 6: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 6: When permitting APDs on existing leases that are not yet developed, the proposed surface disturbance cannot exceed 3% for that area. Consider an exception if: • Additional, effective mitigation is demonstrated to offset the resulting loss of Greater Sage-Grouse (see Objectives). ○ When necessary, conduct additional, effective mitigation in 1) PHMA or – less preferably – 2)	Action C-FFME 6: Same as Alternative B.	Action D-FFME 6: On leased federal fluid mineral estate, when permitting Master Development Plans in PHMA on leases not yet developed, the proposed surface disturbance must achieve no net unmitigated loss of PHMA. Apply requisite seasonal restrictions on exploratory drilling that prohibits surface-disturbing activities in winter habitat and during the lekking, nesting, and early brood-rearing season in all PHMA. When necessary, prioritize and conduct	Action E-FFME 6: All proposed surface disturbances on leased federal fluid mineral estates, within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority,	Action F-FFME 6: When permitting APDs on existing leases that are not yet developed, the proposed surface disturbance cannot exceed 3% per section for that area. Consider an exception if: • Additional, effective mitigation is demonstrated to offset the resulting loss of Greater Sage-Grouse (see	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	GHMA (dependent upon the area-specific ability to increase Greater Sage-Grouse populations). ○ Conduct additional, effective mitigation first within the same population area where the impact is realized, and if not possible then conduct mitigation within the same Management Zone as the impact, per 2006 WAFWA Strategy – pg. 2-17.		additional mitigation: • Within the same population area where the impact is realized; or Within the same WAFWA Management Zone as the impact, unless greater population benefits can be realized outside the population area or WAFWA management zone, subject to BLM and State Wildlife agency consultation and agreement.	General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Objectives). ○ When necessary, conduct additional, effective mitigation in PHMA and GHMA (dependent upon the area-specific ability to increase Greater Sage-Grouse populations). ○ Conduct additional, effective mitigation first within the same population area where the impact is realized, and if not possible then conduct mitigation within the same Management Zone as the impact, per 2006 WAFWA Strategy – pg. 2-17.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFME 7: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 7: Require unitization when deemed necessary for proper development and operation of an area (with strong oversight and monitoring) to minimize adverse impacts on Greater Sage-Grouse according to the Federal Lease Form, 3100-11, Sections 4 and 6.	Action C-FFME 7: Same as Alternative B.	Action D-FFME 7: —	Action E-FFME 7: —	Action F-FFME 7: Same as Alternative B.	
Action A-FFME 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 8: Identify areas where acquisitions (including subsurface mineral rights) or conservation easements, would benefit Greater Sage-Grouse habitat.	Action C-FFME 8: Same as Alternative B.	Action D-FFME 8: —	Action E-FFME 8: —	Action F-FFME 8: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action B-FFME 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 9: For future actions, require a full reclamation bond specific to the site in accordance with 43 CFR 3104.2, 3104.3, and 3104.5. Insure bonds are sufficient for costs relative to reclamation (Connelly et al. 2000a, Hagen et al. 2007) that would result in full restoration of the lands to the condition it was found prior to disturbance. Base the reclamation costs on the assumption that contractors for the BLM or Forest Service will perform the work.	Action C-FFME 9: Same as Alternative B.	Action D-FFME 9: —	Action E-FFME 9: —	Action F-FFME 9: Same as Alternative B.	
Action A-FFME 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 10: Make applicable RDFs consistent with applicable law (see Appendix D of the NTT Report) mandatory as COAs within priority Greater Sage-Grouse habitat.	Action C-FFME 10: Same as Alternative B.	Action D-FFME 10: On leased federal fluid mineral estate (where no APD has been issued), RDFs would be attached as lease notices consistent with applicable law.	Action E-FFME 10: On lease fluid mineral estate, Site-Specific Consultation Based Design Features will be required and determined through the SETT Consultation process (see Appendix D [of the 2015 Final EIS]).	Action F-FFME 10: Same as Alternative B.	
Action A-FFME 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 11: —	Action C-FFME 11: Agencies will explore options to amend, cancel, or buy out leases in ACECs and PHMA.	Action D-FFME 11: —	Action E-FFME 11: —	Action F-FFME 11: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFME 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 12: —	Action C-FFME 12: Include conditions that require relinquishment of leases/authorizations if doing so will: 1) mitigate the impact of a proposed development, or 2) mitigate the unanticipated impacts of an approved development.	Action D-FFME 12: —	Action E-FFME 12: —	Action F-FFME 12: —	
Action A-FFME 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 13: —	Action C-FFME 13: No waivers will be issued.	Action D-FFME 13: —	Action E-FFME 13: —	Action F-FFME 13: —	
Action A-FFME 14: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 14: —	Action C-FFME 14: —	Action D-FFME 14: On leased federal fluid mineral estate within PHMA complete Master Development Plans in lieu of APD-by-APD processing for all but wildcat wells.	Action E-FFME 14: —	Action F-FFME 14: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FFME 15: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FFME 15: —	Action C-FFME 15: —	Action D-FFME 15: On leased federal fluid mineral estate within PHMA, require a full reclamation bond specific to the site. Insure bonds are sufficient for costs relative to reclamation that would result in full restoration. Base the reclamation costs on the assumption that contractors for the BLM will perform the work.	Action E-FFME 15: —	Action F-FFME 15: —	
Fluid Minerals						
Action A-FM 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FM 1: Close PHMA to fluid mineral leasing. Consider an exception when there is an opportunity for the BLM and Forest Service to influence conservation measures where surface and/or mineral ownership is not entirely federally owned (i.e., checkerboard ownership). In this case, a plan amendment may be developed that opens the priority area for new leasing. The plan must demonstrate long-term population increases in the priority area through mitigation (prior to issuing the	Action C-FM 1: Close PHMA to fluid mineral leasing.	Action D-FM 1: In un-leased federal fluid mineral estate in PHMA apply a NSO stipulation and do not allow for waivers, exceptions, or modifications to that stipulation. Upon expiration or termination of existing leases within PHMA, apply the same stipulation as above.	Action E-FM 1: All un-leased federal fluid mineral estate within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation	Action F-FM 1: Close PHMA and GHMA to fluid mineral leasing. Consider an exception: When there is an opportunity for the BLM to influence conservation measures where surface and/or mineral ownership is not entirely federally owned (i.e., checkerboard ownership). In this case, a plan amendment may be developed that opens Greater Sage-Grouse habitat	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	lease) including lease stipulations and off-site mitigation, and avoid short-term losses that put the Greater Sage-Grouse population at risk from stochastic events leading to extirpation.			Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	for new leasing. The plan must demonstrate long-term population increases in the priority area through mitigation (prior to issuing the lease) including lease stipulations, and off-site mitigation, and avoid short-term losses that put the Greater Sage-Grouse population at risk from stochastic events leading to extirpation.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FM 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FM 2: Same as Alternative A.	Action C-FM 2: See C-FM 1.	Action D-FM 2: In un-leased federal fluid mineral estate in GHMA, apply a NSO stipulation, but allow for waivers, exception, or modifications consistent with the objective. Upon expiration or termination of existing leases within GHMA, apply the same stipulation as above.	Action E-FM 2: All un-leased federal fluid mineral estate within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-FM 2: See Action F-FM 1.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FM 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FM 3: Allow geophysical exploration within PHMA to obtain exploratory information for areas outside of and adjacent to PHMA. Only allow geophysical operations by helicopter-portable drilling methods and in accordance with seasonal timing restrictions and/or other restrictions that may apply.	Action C-FM 3: Same as Alternative B.	Action D-FM 3: Allow geophysical exploration within PHMA and GHMA that does not result in crushing of sagebrush vegetation or create new or additional surface disturbance. Heli-portable drilling methods, articulated rubber-tired vehicles that "leave no trace," and vibroseis geophysical operations conducted on existing roads and bladed shoulders would be allowed. Geophysical operations would be subject to TLs and CSU stipulations established for Greater Sage-Grouse in PHMA and GHMA. Allow no use of surface shot methods within PHMA.	Action E-FM 3: All proposed geophysical exploration within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-FM 3: Allow geophysical exploration within PHMA and GHMA to obtain exploratory information for areas outside of and adjacent to PHMA. Only allow geophysical operations by helicopter-portable drilling methods and in accordance with seasonal timing restrictions and/or other restrictions that may apply. Geophysical exploration shall be subject to seasonal restrictions that preclude activities in breeding, nesting, brood rearing and winter habitats during their season of use by Greater Sage-Grouse .	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-FM 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-FM 4: —	Action C-FM 4: —	Action D-FM 4: In un-leased federal fluid mineral estate in GHMA, apply a NSO stipulation, but allow for waivers, exception, or modifications consistent with the objective. Upon expiration or termination of existing leases within GHMA, apply the same stipulation as above.	Action E-FM 4: All un-leased federal fluid mineral estate within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-FM 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Locatable Minerals						
Action A-LOC 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 1: In PHMA, recommend for withdrawal from mineral entry based on risk to the Greater Sage-Grouse and its habitat from conflicting locatable mineral potential and development. • Make any existing claims within the withdrawal area subject to validity exams or buy out. Include claims that have been subsequently determined to be null and void in the proposed withdrawal. • In plans of operations required prior to any proposed surface disturbing activities, include the following: ○ Additional, effective mitigation in perpetuity for conservation (In accordance with existing policy, WO IM 2008-204). Example: purchase private land and mineral rights or severed subsurface	Action C-LOC 1: In PHMA, recommend for withdrawal from mineral entry.	Action D-LOC 1: BLM Public Lands- Authorize locatable mineral development activity per the 43 CFR 3809 regulations through Plan of Operation Approvals and apply mitigation and Greater Sage-Grouse RDFs (consistent with applicable law) that minimizes the loss of PHMA or provides for enhancement of PHMA through off-site mitigation within the WAFWA management zone. Forest Service: Require that new plans of operation on National Forest System lands authorized under 36 CFR 228 Subpart A – Locatable Minerals, include measures to avoid or minimize adverse effects on Greater Sage-Grouse populations or their habitat.	Action E-LOC 1: All new proposed locatable mineral development activities (per the 43 CFR 3809 and 36 CFR 228 Subpart A regulations for BLM and Forest Service administered lands respectively) through Plan of Operation Approvals within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation	Action F-LOC 1: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
	mineral rights within the priority area and deed to US Government). ○ Consider seasonal restrictions if deemed effective.			Credit System (see Action E-SSS-ACDM 5).		
Action A-LOC 2: —	Action B-LOC 2: —	Action C-LOC 2: —	Action D-LOC 2: —	Action E-LOC 2: All new proposed mineral exploration activities within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action	Action F-LOC 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				E-SSS-ACDM 5).		
Action A-LOC 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 3: Make applicable RDFs (consistent with applicable law), Appendix E of the NTT) mandatory as COAs within PHMA.	Action C-LOC 3: Same as Alternative B.	Action D-LOC 3: —	Action E-LOC 3: TMA-15.1: —	Action F-LOC 3: Same as Alternative B.	
Action A-LOC 4: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 4: —	Action C-LOC 4: —	Action D-LOC 4: —	Action E-LOC 4: Through the Nevada Sagebrush Ecosystem Council, encourage the strong conservation ethic in the mining industry by implementing effective avoidance management, and enhancement and reclamation of disturbed lands to preserve, protect, and improve habitat in the SGMA. On federal lands, activities that have an approved BLM or Forest Service notice of intent, plan of operation, ROW, or drilling plan, and on State/Private lands, projects with an approved Nevada Division of Environmental Protection permit, are exempt from any new mitigation requirements above and beyond what has already been stipulated in the projects' approvals.	Action F-LOC 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LOC 5: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 5: —	Action C-LOC 5: —	Action D-LOC 5: —	Action E-LOC 5: Implement a centralized impact assessment process overseen by the Nevada Sagebrush Ecosystem Council that provides consistent evaluation, reconciliation, and guidance for project development that avoids or minimizes conflicts with Greater Sage-Grouse in the SGMA.	Action F-LOC 5: —	
Action A-LOC 6: —	Action B-LOC 6: —	Action C-LOC 6: —	Action D-LOC 6: —	Action E-LOC 6: Follow a strategy that seeks to avoid conflict with Greater Sage-Grouse by locating facilitates and activities in Non-Habitat wherever possible.	Action F-LOC 6: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LOC 7:: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 7: —	Action C-LOC 7: —	Action D-LOC 7: —	Action E- LOC 7: Recognize existing state and federal regulatory mechanisms that govern mining and exploration activities, including BLM 43 CFR 3809 surface management regulations for hard rock mining, Forest Service 36 CFR 228A regulations governing mining and exploration, and NAC 519A regulations for reclamation of mining and exploration projects, that are adequate to conserve Greater Sage-Grouse and sagebrush habitats in the interim until future Suitable conservation plans are approved by the Nevada Sagebrush Ecosystem Council.	Action F- LOC 7: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LOC 8: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 8: —	Action C-LOC 8: —	Action D-LOC 8: —	Action E-LOC 8: Aggressively engage in reclamation efforts as projects are completed, and target reclamation where the ecological site potential exists in the SGMA. Focus efforts on habitat that has the greatest potential for use by Greater Sage-Grouse as guided by ecological site descriptions and other restoration priorities established by the Nevada Sagebrush Ecosystem Council.	Action F-LOC 8: —	
Action A-LOC 9: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 9: —	Action C-LOC 9: —	Action D-LOC 9: —	Action E-LOC 9: Recognize that stipulations for other species (e.g. raptors) may impede the ability to effectively reclaim areas of impact and remove those barriers in order to achieve immediate and effective reclamation.	Action F-LOC 9: —	
Action A-LOC 10: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 10: —	Action C-LOC 10: —	Action D-LOC 10: —	Action E-LOC 10: Prioritize areas for habitat improvement utilizing sound resource information including soil surveys, ecological site descriptions, and Greater Sage-Grouse population data.	Action F-LOC 10: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-LOC 11: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 11: —	Action C-LOC 11: —	Action D-LOC 11: —	Action EB-LOC 11: Design exploration projects for mineral access and the betterment of habitat. Ensure roads and other ancillary features that impact Greater Sage-Grouse habitat are designed to avoid where feasible and otherwise minimize and mitigate impacts in the short and long term.	Action F-LOC 11: —	
Action A-LOC 12: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 12: —	Action C-LOC 12: —	Action D-LOC 12: —	Action E-LOC 12: Differentiate between short-(exploration) and long-term (active mining) impacts and manage timing of operations and physical disturbance accordingly.	Action F-LOC 12: —	
Action A-LOC 13: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-LOC 13: —	Action C-LOC 13: —	Action D-LOC 13: Close or mitigate abandon mines sites within PHMA and GHMA to reduce predation of Greater Sage-Grouse by eliminating physical structures that could provide nesting opportunities and perching sites for predators.	Action E-LOC 13: —	Action F-LOC 13: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Salable Minerals						
Action A-SAL 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SAL 1: Close PHMA to mineral material sales.	Action C-SAL 1: Close PHMA to mineral material sales.	Action D-SAL 1: Allow no new salable mineral material sites in PHMA and GHMA.	Action E-SAL 1: All new proposed salable mineral sites within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-SAL 1: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-SAL 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SAL 2: In PHMA, restore salable mineral pits no longer in use to meet Greater Sage-Grouse habitat conservation objectives.	Action C-SAL 2: Same as Alternative B.	Action D-SAL 2: In PHMA, reclaim salable mineral materials sites no longer in use to meet Greater Sage-Grouse habitat objectives (see Table 2-11 in section 2.8.5 of this Chapter).	Action E-SAL 2: See Role of Sagebrush Ecosystem Technical Team.	Action F-SAL 2: Same as Alternative B.	
Action A-SAL 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-SAL 3: —	Action C-SAL 3: —	Action D-SAL 3: On existing mineral materials sites, allow mineral materials sales in PHMA and GHMA as required, to meet Federal, Tribal, State, County and public needs. Loss of habitat through disturbance in PHMA and GHMA would be off-set through mitigation. Additional mitigation, including off-site mitigation would be required to off-set any net loss of habitat as a result of authorizing expansion of existing materials pits. Habitat loss in PHMA and GHMA would be off-set through mitigation to ensure no net un-mitigated loss. All mineral materials activities would be subject to compliance with standard surface use stipulations (general	Action E-SAL 3: Existing mineral material sites would only trigger SETT Consultation and the "avoid, minimize mitigate" process if there is a proposal to expand activities within the SGMA. Allow mineral materials sales in the SGMA as required, to meet Federal, Tribal, State, County, and public needs.	Action F-SAL 3: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
			occupancy, seasonal and yearlong TLs, and CSU stipulations) for Greater Sage-Grouse in PHMA and GHMA.			
Action A-SAL 4: No common action across LUPs within the sub-region. See Section 2.10.10.1.	Action B-SAL 4: —	Action C-SAL 4: —	Action D-SAL 4: Close or mitigate abandon mines sites within PHMA and GHMA to reduce predation of Greater Sage-Grouse by eliminating physical structures that could provide nesting opportunities and perching sites for predators.	Action E-SAL 4: —	Action F-SAL 4: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Nonenergy Leasable Minerals						
Action A-NEL 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-NEL 1: Close PHMA to nonenergy leasable mineral leasing. This includes not permitting any new leases to expand an existing mine.	Action C-NEL 1: Close PHMA to nonenergy leasable mineral leasing.	Action D-NEL 1: Close PHMA and GHMA to nonenergy leasable mineral leasing.	Action E-NEL 1: All new proposed nonenergy leasable mineral leasing within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-NEL 1: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-NEL 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-NEL 2: —	Action C-NEL 2: —	Action D-NEL 2: Issue no nonenergy leasable prospecting permits within PHMA and GHMA.	Action E-NEL 2: All new proposed nonenergy leasable prospecting permits within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).	Action F-NEL 2: —	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
Action A-NEL 3: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-NEL 3: For existing nonenergy leasable mineral leases in PHMA, in addition to the solid minerals RDFs consistent with applicable law (Appendix E of NTT), follow the same RDFs applied to Fluid Minerals consistent with applicable law (Appendix D of NTT), when wells are used for solution mining.	Action C-NEL 3: Same as Alternative B.	Action D-NEL 3: —	Action E-NEL 3: —	Action F-NEL 3: Same as Alternative B.	
Mineral Split Estate						
Action A-MSE 1: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-MSE 1: Where the federal government owns the mineral estate in PHMA, and the surface is in nonfederal ownership, apply the conservation measures applied on public lands.	Action C-MSE 1: Same as Alternative B.	Action D-MSE 1: Where the federal government owns the mineral estate in PHMA and GHMA and the surface is in nonfederal ownership and adjacent to public lands, apply the appropriate conservation measures and RDFs consistent with applicable law on public lands.	Action E-MSE 1: All new proposed surface development activities in which the federal government owns the mineral estate and the surface is in nonfederal ownership within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the	Action F-MSE 1: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				applicable management category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).		
Action A-MSE 2: No common action across LUPs within the sub-region. See Section 2.10.1.	Action B-MSE 2: Where the federal government owns the surface, and the mineral estate is in nonfederal ownership in PHMA, apply appropriate Fluid Mineral RDFs consistent with applicable law (see Appendix D of NTT) to surface development.	Action C-MSE 2: Same as Alternative B.	Action D-MSE 2: Where the federal government owns the surface and the mineral estate is in nonfederal ownership in PHMA and GHMA, apply appropriate surface use stipulations and RDFs to surface development consistent with applicable law.	Action E-MSE 2: All new proposed surface development activities in which the federal government owns the surface and the mineral estate is in nonfederal ownership within the SGMA will trigger SETT Consultation (See Action E-SSS-ACDM 1) for application of the "avoid, minimize, mitigate" process to ensure no net unmitigated loss of Greater Sage-Grouse habitat due to anthropogenic disturbances within the SGMA. This includes application of the "avoid process" according to the applicable management	Action F-MSE 2: Same as Alternative B.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
				category (Core, Priority, General, and Non-Habitat) (see Action E-SSS-ACDM 3); incorporation of Site-Specific Consultation Based Design Features (see Action E-SSS-ACDM 4 and Appendix D [of the 2015 Final EIS]) to minimize impacts; and mitigation of impacts through the Conservation Credit System (see Action E-SSS-ACDM 5).		
Special Designations-Areas of Critical Environmental Concern (ACECs)						
Action A-SD 1: No common action across LUPs within the sub-region. See Section 2.10.1. No new ACECs are proposed. Continue to manage 246,276 acres in 29 existing ACECs (which contain Greater Sage-Grouse PHMA and GHMA habitat) in accordance with existing ACEC management prescriptions for the protection of their respective Relevance and Importance Values. Some management prescriptions for the existing ACECs will also	Action B-SD 1: —	Action C-SD 1: Designate the following proposed ACECs and Zoological Conservation Areas (FS)to preserve, protect, conserve, restore, and sustain Greater Sage-Grouse populations and the sagebrush ecosystem on which the Greater Sage-Grouse relies. • Black Rock (239,300 acres) • Butte/Buck/White Pine (669,800 acres) • Central Elko (1,680,500 acres) • Central Great	Action D-SD 1: Same as Alternative A.	Action E-SD 1: —	Action F-SD 1: Designate the following proposed ACECs (BLM) and Zoological Conservation Areas (FS) as sagebrush reserves to conserve Greater Sage-Grouse - and other sagebrush-dependent species. • Bates Mountain (242,200 acres) • Cortez Range (76,300 acres) • Fish Creek Mountains (39,500 acres) • Little Fish Lake Valley (87,700 acres)	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
be beneficial to Greater Sage-Grouse habitat.		Basin (1,216,500 acres) • East High Desert (241,500 acres) • Lassen/South Washoe (683,400 acres) • Likely Tables PMU (9,600 acres) • Lone Willow (332,200 acres) • Monitor (444,100 acres) • Northeast Elko (317,600 acres) • Northwest Great Basin – NV (1,086,700 acres) • Northwest Interior (176,500 acres) • Owyhee (1,357,900 acres) • Pueblo Range (7,200 acres) • Ruby (504,200 acres) • Smith/Reese (283,200 acres) • Southeastern Nevada (315,900 acres • West Pershing (7,200 acres) Continue to manage 237,000 acres in 29 existing ACECs (which contain			• Monitor (53,400 acres) • Monitor Valley (173,600 acres) • Reese River (92,200 acres) • Roberts Mountain (74,400 acres) • Telegraph Mountain (9,100 acres) Continue to manage 237,000 acres in 29 existing ACECs (which contain Greater Sage-Grouse PHMA and GHMA habitat) in accordance with existing ACEC management prescriptions for the protection of their respective Relevance and Importance Values. The more restrictive management prescriptions in either existing management or proposed management will predominate.	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
		Greater Sage-Grouse PHMA and GHMA habitat) in accordance with existing ACEC management prescriptions for the protection of their respective Relevance and Importance Values. The more restrictive management prescriptions in either existing management or proposed management will predominate. Special Management: To protect the relevance and importance values of the Greater Sage-Grouse and habitat, . Management prescriptions for PHMA, as addressed under every resource above, would apply.			Special Management: To protect the relevance and importance values of the Greater Sage-Grouse and habitat, management prescriptions for PHMA, as addressed under every resource above, would apply. There are a few management prescriptions that would be unique for the ACECs under this alternative: • No new mechanized or motorized routes within 4 miles of leks or within PHMA. • Seasonally prohibit camping and nonmotorized recreation within 4 miles of active leks • Prioritize acquisition of private lands in ACECs over easements	

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E*	Alternative F	
					• Do not use Categorical Exclusion to resolve Section 390 resource conflicts in PHMA	

*Alternative E was submitted by the State of Nevada's Governor's office and only covers land within the decision area in the State of Nevada (also in Appendix O [of the 2015 Final EIS]). The State of California did not submit a Sage Grouse Conservation Plan as part of this planning effort, therefore, under Alternative E, the lands in California were analyzed as the No Action Alternative.

[1]The use of — indicates that there is no similar action, or that the similar action is reflected in another management action in the alternative.

[2]BMPs as currently referred to would become RDFs to be applied consistent with applicable law.

2.7 PLAN EVALUATION, MONITORING, AND ADAPTIVE MANAGEMENT

Plan evaluation is the process by which the plan and monitoring data are reviewed to determine if management objectives are being met and progress is being made toward meeting management goals and if management direction is sound. RMP evaluations determine if decisions are being implemented, if mitigation measures are satisfactory, if there are significant changes in the related plans of other entities, if there are new data of significance to the plan, and if decisions should be amended or revised.

Monitoring data gathered over time are examined and used to draw conclusions on whether management actions are meeting stated objectives, and if not, why. Conclusions are then used to make recommendations on whether to continue current management or to identify what changes need to be made in management practices to meet objectives. The BLM would use RMP evaluations to determine if the decisions in this Proposed RMPA, supported by the accompanying NEPA analysis, are still valid in light of new information and monitoring data.

Evaluations would follow the protocols established by the BLM Land Use Planning Handbook (H-1601-1), DOI Adaptive Management Guidance (including Williams et. al 2009, Adaptive Management: The US Department of the Interior Guide) and other appropriate guidance in effect at the time the evaluation is initiated.

This RMPA/EIS also includes an adaptive management strategy that can be found in **Appendix F**.

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Chapter 3. Affected Environment

3.1 INTRODUCTION

The purpose of this chapter is to describe the existing biological, physical, and socioeconomic characteristics of the planning area, including human uses that could be affected by implementing the alternatives described in **Chapter 2**. The affected environment provides the context for assessing potential impacts described in **Chapter 4**. The resource topics included in this chapter reflect those in **Table 1-2** as corresponding to an issue carried forward for detailed analysis in the 2015 Final EIS and the 2019 planning process.

The BLM analyzed the management situation in full compliance with its regulations and policies. The BLM evaluated inventory and other data and information, partnering with USGS and coordinating extensively with States, to help provide a basis for formulating reasonable alternatives. The BLM described this process in its Report to the Secretary in response to SO 3353 (Aug. 4, 2017). Among other things, the Report describes how the BLM coordinated "with each State to gather information related to the [Secretary's] Order, including State-specific issues and potential options for actions with respect to the 2015 Greater Sage-Grouse Plans and Instruction Memorandums (IMs) to identify opportunities to promote consistency with State plans." (Report to the Secretary at 3.) This process overlapped to some degree with the BLM's scoping process, which also assisted the BLM in identifying the scope of issues to be addressed and significant issues, and with coordination with the States occurring after the Report.

The geographic extent of this environmental analysis is the same as that in the 2015 Final EIS. The BLM acknowledges that there have been changes to the landscape since 2015; however, due to the scale of this analysis covering 45,359,000 acres of BLM-administered lands, data collected consistently across the range indicate that the extent of these changes to the landscape are relatively minimal. For example, BLM monitoring data collected and analyzed annually at the biologically significant unit (BSU) scale, as outlined in the Greater Sage-Grouse Monitoring Framework (Appendix D of the 2015 ARMPA/ROD), indicates that there has been a minimal overall increase in estimated disturbance of less than 1 percent from 2015 through 2017 of Priority Habitat Management Areas (PHMA) within BSUs. It is also important to note that consistent with the 2015 ARMPA/ROD, any discretionary actions contributing to anthropogenic disturbance were required to comply with the mitigation hierarchy of avoid, minimize, and compensate to achieve a net conservation gain.

Estimates of Greater Sage-Grouse Habitat Management Areas (HMA) burned for 2016 and 2017 indicate a sharp increase in potential habitat availability loss during 2017, compared with previous fire seasons (**Sections 3.1.1** and **3.4**, below); however, through the BLM's Emergency, Stabilization, and Rehabilitation efforts, many of these areas are currently undergoing rehabilitation.

Actions since the 2015 Final EIS were authorized consistent with that document. The BLM would continue to implement the decisions in the 2015 Final EIS, unless those decisions are amended.

Acreage figures and other numbers were approximated using a geographic information systems (GIS) technology; they do not reflect exact measurements or precise calculations.

3.1.1 Greater Sage-Grouse Literature, 2015–2018

As part of the consideration of whether to amend some, all, or none of the 2015 Greater Sage-Grouse land use plans, the BLM requested the USGS to inform the effort through the development of an annotated bibliography of Greater Sage-Grouse science published since January 2015 (Carter et al. 2018)[1] and a report that synthesized and outlined the potential management implications of this new science (Hanser et al. 2018).[2]

Following the 2015 Final EIS, the scientific community has continued to improve the knowledge available to inform implementation of management actions and an overall understanding of Greater Sage-Grouse populations, their habitat requirements, and their response to human activity. The report discussed the science related to six major topics identified by USGS and BLM (summarized below), as follows:

- Multiscale habitat suitability (habitat objectives) and mapping tools
- Discrete human activities
- Diffuse activities
- Fire and invasive species
- Restoration effectiveness
- Population estimation and genetics

Multiscale Habitat Suitability (Habitat Objectives) and Mapping Tools

Since the 1950s, biologists have worked to develop a set of site-scale vegetation indicators to inform habitat management, including the collection and analysis of Greater Sage-Grouse habitat use, nest success, and population trends relative to vegetation condition (Patterson 1952; Sveum et al. 1998a, 1998b; Connelly et al. 2000b; Holloran et al. 2005; Hagen et al. 2007; Kolada et al. 2009; Kaczor et al. 2011).

The existing state of knowledge for Greater Sage-Grouse habitat use at the site scale has been described and synthesized (Connelly et al. 2000a; 2011; Hagen et al. 2007; Stiver et al. 2015). This information was included in the Habitat Objectives (Table 2-2) in the 2015 Final EIS. The science developed since 2015 largely corroborates the knowledge prior to 2015 regarding Greater Sage-Grouse habitat selection.

Improvements at the site scale facilitate a better understanding that indicates the potential need for a reevaluation of the existing habitat objective indicators and associated values in Table 2-2 in the 2015 Final EIS (Hanser et al. 2018).

Some of the science that was developed since 2015 that may require reevaluation and incorporation in the Habitat Objectives for Greater Sage-Grouse (Table 2-2 in the 2015 Final EIS) includes the following:

The importance of mesic habitats for Greater Sage-Grouse brood-rearing identified in western Nevada, eastern California, and southeastern Oregon (Donnelly et al. 2016).

[1] Available online: https://doi.org/10.3133/ofr20181008
[2] Available online: https://doi.org/10.3133/ofr20181017

- Big and other sagebrush were important for Greater Sage-Grouse, but the species of sagebrush shrub usually varied across life stages within Nevada and northeastern California (Coates et al. 2016). Additionally, this study found selection for upland mesic sites during the brood-rearing season and general avoidance of landscapes dominated by nonnative annual grass across all seasons (Coates et al. 2016).
- Nesting and late brood-rearing microhabitat selection and linkages to survival were quantified in xeric and mesic regions of the Great Basin (primarily Nevada; Coates et al. 2017a). All vegetation measurements were phenologically corrected (Gibson et al. 2016), and the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late brood-rearing across all sites. Indicator values for grass height need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors and are geographically appropriate. Results from this study also provide more targeted guidelines for Greater Sage-Grouse microhabitat in Nevada and California, compared with broader range-wide guidelines published previously (Connelly et al. 2000).
- Adult females in areas impacted by wildfire 10 years prior tended to use other shrubs for nesting cover, suggesting that other shrub species might need to be considered in evaluations of fire-affected environments (Lockyer et al. 2015; Coates et al. 2017a).
- Hens and broods avoided pinyon-juniper by at least 68 meters in Nevada and California (Coates et al. 2016a).
- A model concluded hens and broods avoided edges with trees (conifers or willows) in late brood-rearing habitats (Westover et al. 2016).

The BLM has completed a plan maintenance action, whereby the agency has clarified its ability to modify the habitat objective indicator values in Table 2-2 in the 2015 Final EIS, based on local, site-specific information.

Mapping Tools

Advances in modeling and mapping techniques at the range-wide scale can help inform broad-scale habitat assessment, allocations, and targeting of land management resources to benefit Greater Sage-Grouse conservation. The 2015 Final EIS included the 2014 version of the "Spatially explicit modeling of Greater Sage-Grouse (*Centrocercus urophasianus*) habitat in Nevada and northeastern California—A decision-support tool for management"-USGS Open-File Report 2014-1163 (Coates et al. 2014) to delineate Greater Sage-Grouse HMAs within the planning area.

In 2016, the USGS updated the 2014 decision support tool, as follows:

- Adding radio and global positioning system (GPS) telemetry locations from Greater Sage-Grouse monitored at multiple sites during 2014 to the original location dataset beginning in 1998
- Integrating high resolution maps of sagebrush and pinyon and/or juniper cover
- Modifying the spatial extent of the analyses to match newly available vegetation layers
- Accounting for differences in habitat availability between mesic sagebrush steppe communities in the northern part of the study area and drier Great Basin sagebrush in southerly regions

- Deriving updated land management categories and an updated index of Greater Sage-Grouse abundance and space-use
- Masking urban footprints and major roadways out of the final map products

Based on continued efforts to refine and improve Greater Sage-Grouse habitat mapping and incorporate the best available science, the BLM is considering adopting the updated 2016 spatially explicit model - USGS Open-File Report 2016-1080 (Coates et al. 2016), which was adopted by the State of Nevada and recommended for adoption by the State of California. Adoption of Coates et al. 2016 would allow the BLM to update delineations for Greater Sage-Grouse HMAs (PHMA, GHMA, and OHMA).

Discrete Anthropogenic Activities

The science developed since 2015 corroborates the knowledge prior to 2015 regarding the impact of discrete human activities on Greater Sage-Grouse. New science suggests that strategies to limit surface disturbance may be successful at limiting range-wide population declines, but they are not expected to reverse the declines, particularly where active oil and gas operations are present (Hanser et al. 2018). This information may have relevance when considering the impact of changes to management actions designed to limit discrete disturbances.

Diffuse Activities

The science developed since 2015 does not appreciably change the knowledge prior to 2015 regarding diffuse activities (e.g., livestock grazing, predation, hunting, wild horses and burros, fences, recreation, etc.); however, some study authors questioned current assumptions, provided refinements, or corroborated existing understanding. This information was considered when determining the scoping issues addressed in **Chapter 1**, **Section 1.4.1**.

Studies have shown that the effects of livestock grazing will vary with grazing intensity and season. Predation can be limiting to Greater Sage-Grouse populations in areas with overabundant predator numbers or degraded habitats. Application of predator control has potential short-term benefits in small, declining populations; however, reducing human subsidies may be necessary to generate long-term changes in raven numbers. This is because raven control has produced only short-term declines in local raven populations.

Refinements to the current hunting seasons used by state wildlife agencies may minimize potential effects on Greater Sage-Grouse populations, but none of the studies implicated current application of hunting seasons and timings as a plausible cause for Greater Sage-Grouse declines. Finally, no new insights into the effects of wild horses and burros, fence collision, or recreational activity on Greater Sage-Grouse have been developed (Hanser et al. 2018).

Fire and Invasive Species

Science since 2015 indicates that wildfire will continue to threaten Greater Sage-Grouse through loss of available habitat, reductions in multiple vital rates, and declining population trends, especially in the western part of its range. The concepts of resilience after wildfire and resistance to invasion by nonnative annual grasses have been mapped across the sagebrush ecosystem using links to soil temperature and moisture regimes. These concepts inform restoration and management strategies and help prioritize application of Greater Sage-Grouse management resources (Hanser et al. 2018).

Restoration Effectiveness

Since 2015, tools have been developed to help managers strategically place and design restoration treatments where they will have the greatest benefit for Greater Sage-Grouse. Conifer removal benefited Greater Sage-Grouse through increased female survival and nest and brood success.

Treatment methods and site potential can affect post-treatment vegetation characteristics. Sagebrush manipulation treatments seem to benefit Greater Sage-Grouse populations and brood-rearing habitat availability, but benefits may be limited to areas with high sagebrush cover at higher elevations and in mountain big sagebrush (*Artemisia tridentata vaseyana*) communities. Studies indicate that Greater Sage-Grouse populations did not benefit from, or were negatively affected by, prescribed fire and mechanical sagebrush removal treatments (Hanser et. al. 2018). Restoration activities occur mainly at the implementation level, and the BLM maintains the flexibility to incorporate new tools in the agency's project planning for restoration actions.

Population Estimation and Genetics

The accuracy of estimating Greater Sage-Grouse populations has increased because of improved sampling procedures used to complete count surveys at leks and the development of correction factors for potential bias in lek count data. In addition, techniques to map Greater Sage-Grouse genetic structure at multiple spatial scales has also improved. This genetic data is used in statistical models to increase understanding of how landscape features and configuration affect gene flow. This understanding emphasizes the importance of maintaining connectivity between populations to ensure genetic diversity and distribution (Hanser et al. 2018). New information continues to affirm the BLM's understanding that Greater Sage-Grouse is a species that selects for large, intact landscapes and habitat patches.

3.2 RESOURCES AFFECTED

Per **Chapter 1** (see **Section 1.4.1**), the following resources may have potentially significant effects based on the actions considered in **Chapter 2**. **Table 3-1**, below, provides the location of baseline information in the 2015 Final EIS, and, where applicable, additional information contained in the Sagebrush Focal Area Withdrawal Draft EIS (BLM 2016b).

Table 3-1
Affected Environment Incorporated by Reference

Resource Topic	Location of Baseline Information
Greater Sage-Grouse and its Habitat	Chapter 3, Section 3.2 (Greater Sage-Grouse and Greater Sage-Grouse Habitat), page 3-3 to 3-41 (BLM 2015) Chapter 3, Section 3.7 (Wildlife and Special Status Animals, including Greater Sage-Grouse), page 3-139 to 3-180 (BLM 2016)
Vegetation (Including Invasive and Exotic Species and Noxious Weeds)	Chapter 3, Section 3.3 (Vegetation [Including Invasive and Exotic Species and Noxious Weeds]), page 3-41 to 3-57 (BLM 2015) Chapter 3, Section 3.6 (Vegetation, Including Special Status Plants), page 3-128 to 3-138 (BLM 2016)
Livestock Grazing	Chapter 3, Section 3.8, (Livestock Grazing) page 3-93 to 3-101 (BLM 2015)
Land Use and Realty	Chapter 3, Section 3.11 (Land Use and Realty), page 3-110 to 3-121 (BLM 2015)
Renewable Energy	Chapter 3, Section 3.12 (Renewable Energy Resources), page 3-121 to 3-124 (BLM 2015)

Resource Topic	Location of Baseline Information
Mineral Resources	Chapter 3, Section 3.13 (Mineral Resources), page 3-124 to 3-143 (BLM 2015) Chapter 3, Section 3.4 (Geology and Mineral Resources), page 3-2 to 3-8 (BLM 2016)
Socioeconomics	Chapter 3, Section 3.23 (Socioeconomics and Environmental Justice), page 3-193 to 3-231 (BLM 2015) Chapter 3, Section 3.5 (Social and Economic Conditions), page 3-9 to 3-127 (BLM 2016)
Comprehensive Travel Management	Chapter 3, section 3.10 (Comprehensive Travel and Transportation Management), page 3-104 to 3-110 (BLM 2015)

3.2.1 Resources Not Carried Forward for Analysis

The following resources and resource uses analyzed in the 2015 Final EIS were reviewed to determine if they could have potentially significant effects based on the actions considered in **Chapter 2**. Aligning BLM management with the State of Nevada's Conservation Plan and with the State of California's conservation strategies and incorporating the best available current science and better balancing of multiple uses in regard to HMA mapping, adaptive management, mitigation, and seasonal timing restrictions would not substantially alter management direction or result in different outcomes. Because of this, no additional analysis was completed for the resources shown in **Table 3-2** below; therefore, no new information on affected environment is provided.

Table 3-2
Resources and Resource Uses Not Carried Forward for Analysis

Riparian Areas and Wetlands	Recreation
Fish, Wildlife, and Special Status Species	Visual Resources
Wild Horses and Burros	Special Designations
Water Resources	Soils
Lands with Wilderness Characteristics	Air Quality
Climate Change	

3.3 GREATER SAGE-GROUSE AND ITS HABITAT

The existing condition of Greater Sage-Grouse in the planning area is described in the 2015 Final EIS in Section 3.2; therefore, except as otherwise expressly indicated by new or updated information contained in this section, the affected environment for Greater Sage-Grouse described in the 2015 Final EIS is hereby incorporated by reference.

Since 2015, the BLM and Forest Service have been implementing the Greater Sage-Grouse conservation measures outlined in the 2015 Final EIS. In addition to working with partners, such as NDOW, CDFW, and USGS, to monitor the status of Greater Sage-Grouse populations in the planning area, the BLM has also been tracking human disturbance, wildland fire, and reclamation/restoration efforts in Greater Sage-Grouse HMAs.

3.3.1 Greater Sage-Grouse Population Status

Management Zones

The Nevada and Northeastern California Sub-regional planning area includes Greater Sage-Grouse habitat and populations in three management zones (MZs), as delineated by Western Association of Fish and Wildlife Agencies (WAFWA). The boundaries of these MZs were delineated based on their ecological and biological attributes, rather than on arbitrary political boundaries (Stiver et al. 2006). Vegetation found in each management zone is similar, and Greater Sage-Grouse and its habitat in these areas are likely to respond similarly to environmental factors and management actions.

MZs in the Nevada and Northeastern California sub-region are as follows:

- MZ III—Southern Great Basin (includes Utah, Nevada, and California)
- MZ IV—Snake River Plain (includes Idaho, Utah, Nevada, Oregon, Montana and Wyoming)
- MZ V—Northern Great Basin (includes Oregon, California, and Nevada)

These MZs and their aggregate populations and subpopulations in the Nevada and Northeastern California Sub-region are described in Table 3-5 and Figure 3-3 of the 2015 Nevada and Northeastern California Proposed Land Use Plan Amendments and Final EIS (BLM 2015a; 2015 Final EIS).

As of 2017, there were 717 leks classified as active and 341 leks classified as inactive, as shown in **Table 3-3**.

Table 3-3
Leks in Population/Subpopulations

Population/ Subpopulation	Active	Inactive	Total
Management Zone III			
Central Nevada	185	83	269
Northwestern Interior Nevada	0	8	8
Quinn Canyon Range Nevada	N/A	N/A	N/A
Southeastern Nevada	132	22	154
Management Zone IV			
North-central Nevada	60	40	100
Northeastern Nevada	195	82	277
Management Zone V			
Klamath-Oregon/California	1	0	1
Lake Area Oregon-NE California/NW Nevada	99	84	183
South-central Oregon/North-central Nevada	39	22	61
Warm Springs Valley Nevada	6	0	6

Sources: NDOW, CDFW and WAFWA 2017

In a recent publication by USGS (Coates et al. 2017b), data from monitored Greater Sage-Grouse lek sites across Nevada and Northeastern California from 2000 to 2016 were used to estimate annual rates of change in Greater Sage-Grouse populations. As of 2016, populations across Nevada and northeastern

California have declined at an average rate of 3.86 percent annually over the last 17 years. This estimated rate of population decline corresponds to other estimates documented for Greater Sage-Grouse in the Great Basin (Garton et al. 2011; Coates et al. 2016a).

Overall results indicate that localized fluctuations in lek attendance have occurred, but overall numbers of active and inactive leks have been relatively stable. Of all the MZs within the sub-region, MZ III had the most number of leks in decline.

The 2015 Nevada and Northeastern California Sub-regional ARMPA incorporated an adaptive management strategy that included population triggers for leks, lek clusters, and biologically significant units across the sub-regional planning area. Calculating the 2015 adaptive management population triggers required the use of a hierarchical population model that was created by USGS in partnership with the BLM, USFWS, Nevada Department of Wildlife, and the California Department of Fish and Wildlife. Shortly after the signing of the ROD approving the 2015 ARMPA, USGS restructured the model with best available information, which in turn modified the numeric triggers contained in the 2015 ARMPA (see *Centrocercus urophasianus) in Nevada and California—Identifying populations for management at the appropriate spatial scale: U.S. Geological Survey Open-File Report 2017-1089*, https://doi.org/10.3133/ofr20171089)). Therefore, as part of the 2019 plan amendment process, the BLM analyzed and adopted the updated numeric population triggers and the updated USGS model to calculate these triggers on an annual basis.

Given the 2019 preliminary injunction, BLM Nevada and California are unable to implement the 2019 Adaptive Management Strategy. However, the state of Nevada has adopted the same strategy as part of their State's Greater Sage-Grouse Conservation Plan and is moving forward with implementing the strategy in cooperation with BLM Nevada and California, NDOW, local working groups and other partners. The latest run of the model results identified population triggers have been tripped in the Nevada and Northeastern Sub-region.

3.4 Wildland Fire and Habitat Treatment

The wildland fire threat was discussed in the 2015 Final EIS (Section 3.2.3). Ongoing efforts for fuel treatments are described in Executive Order 13855, *Promoting Active Management of America's Forests, Rangelands, and other Federal Lands to Improve Conditions and Reduce Wildfire Risk* (December 21, 2018), and Secretary's Order 3372, *Reducing Wildlife Risks on Department of Interior Land through Active Management* (January 2, 2019), which provide direction to the BLM to address wildfire prevention and suppression, which the BLM has implemented by setting ambitious fuel treatment targets to protect and restore sagebrush ecosystems.

From 2015 to 2017 there have been additional large-scale wildfires within the decision area (**Table 3-4**, below). These wildfires burned over 1.3 million acres of HMAs (as depicted in **Figure 2-2a**) within the planning area, which included approximately 358,000 acres in PHMA, 400,500 acres in GHMA and 373,000 acres in OHMA, resulting in a reduction of available Greater Sage-Grouse habitat. During that same time, approximately 175,546 acres in Greater Sage-Grouse HMAs have been treated to improve habitat for the species (see **Table 3-5** and **Table 3-6**).

Table 3-4
Wildland Fire Statistics—Greater Sage-Grouse Habitat Acres Burned

State	2015	2016	2017
Nevada	12,233	215,073	967,324
California	16,176	5,145	88,551
Total	**28,409**	**220,218**	**1,055,875**

Source: Greater Sage-Grouse Habitat Data for Wildland Fire Management Decision Making and Reporting of Acres Burned; Information Bulletin No. FA IB-2017-009; Bureau of Land Management. Note: habitat acres burned are based on **Figure 2-2a**.

Table 3-5
Acres of Greater Sage-Grouse Conservation Actions in Nevada

Year	Conifer Removal	Fuel Breaks	Invasive Species Removal	Habitat Protection	Habitat Restoration	Total
2015	12,883	3,809	7,311	351	17,957	42,311
2016	19,785	6,655	10,956	644	14,753	52,793
2017[1]	40,386	4,455	2,265	12,561	1,378	61,045
Total	**73,054**	**14,919**	**20,532**	**13,556**	**34,088**	**156,149**

Source: National Fuels Reporting Operations Reporting System (NFPORS)

Table 3-6
Acres of Greater Sage-Grouse Conservation Actions in California

Year	Conifer Removal	Fuel Breaks	Invasive Species Removal	Habitat Protection	Habitat Restoration	Total
2015	5,403	217	2,545	1,360	0	9,525
2016	2,735	0	1,643	1,653	0	6,031
2017[1]	5,769	0	1,802	2,260	0	9,831
Total	**13,907**	**217**	**5,990**	**5,273**	**0**	**25,387**

Source: NFPORS 2017

Since the 2015 plan, more habitat in Greater Sage-Grouse HMAs has been lost to wildfire than has been gained through treatment; however, the BLM intends to implement more habitat improvements projects, per the decisions in the 2015 Final EIS. Projects such as the Great Basin Ecosystem Strategy would further enhance the tools and priorities for implementing these activities. Under these projects, two programmatic EISs are being prepared for fuel breaks, fuels reduction, and rangeland restoration. See Wildland Fires (Section 3.7) in the 2015 Final EIS for acres burned by decade.

3.5 HUMAN DISTURBANCE

Human disturbance was discussed in the 2015 Final EIS (Section 3.2.4, Regional Context [Infrastructure]). The BLM tracked direct human disturbance in PHMA from 2015 to 2017, in accordance with the Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment Record of Decision, Management Decision, Special Status Species 2 (BLM 2015).

Direct human disturbance has incrementally increased over the Nevada and Northeastern California Sub-region, with the greatest percentage increase of 0.12 and an average across all of the BSUs of 0.01 percent. The level of human disturbance in the Butte/Buck/White Pine BSU decreased by 62 acres (0.01 percent) during this time. It is also important to note that consistent with the 2015 ARMPA/ROD, any discretionary actions contributing to anthropogenic disturbance during this time were required to comply with the mitigation hierarchy of avoid, minimize, and compensate to achieve a net conservation gain.

3.6 SOCIOECONOMICS

Since 2015, socioeconomic conditions in Nevada have changed to some degree. Income from non-service industries has fallen slightly, while service industry jobs and income have increased at a steady rate.

Many industry sectors remained mostly steady from 2014 to 2016, the most recent year for which verified data are available. For example, earnings from the mining industry, including fossil fuels, grew by slightly more than 1 percent during that period. In contrast, earnings from government (which includes federal, military, state, and local government employment, as well as government enterprise) grew by 6.1 percent; earnings from the medical and social assistance industries grew by 11.5 percent, and earnings from the construction industry increased by more than 26 percent from 2014 to 2016. Construction has been in recovery, after falling by more than 63 percent from 2006 to 2013.

Chapter 4. Environmental Consequences

4.1 Introduction

This chapter presents the anticipated direct, indirect, and cumulative impacts on the human and natural environment from implementing the alternatives in **Chapter 2**. The purpose of this chapter is to describe to the decision maker and the public the differences between the entire range of alternatives considered in 2018, including the 2018 Draft Plan (Management Alignment Alternative), the 2018 Proposed Plan Amendment, as well as the range of alternatives incorporated by reference from the 2015 plan amendments. It is meant to clarify that Greater Sage-Grouse management was comprehensively analyzed in 2018 through multiple NEPA and planning processes.

This chapter is organized by topic, based on the affected resources identified in **Chapters 1** and **3**. Only those issues listed in **Table 1-2** were carried forward for analysis.

Impact analysis is a cause-and-effect process. The detailed impact analyses and conclusions are based on the following:

- The BLM planning team's knowledge of resources and the planning area
- Literature reviews
- Information provided by experts in the BLM, other agencies, cooperating agencies, interest groups, and concerned citizens

The baseline used for the impact analysis is the current condition or situation, as described in **Chapter 3**. Impacts on resources and resource uses are analyzed and discussed, commensurate with resource issues and concerns identified through the NEPA process. At times, impacts are described in qualitative terms or using ranges of potential impacts.

This SEIS describes more explicitly the full range of alternatives that the BLM has evaluated, summarizing each action alternative contained in the 2015 and 2018 EISs.

4.2 Analytical Assumptions

Several overarching assumptions have been made in order to facilitate the analysis of the potential impacts. These assumptions set guidelines and provide reasonably foreseeable projected levels of development that would occur in the planning area during the planning period. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative, as described in **Chapter 2**.

The following general assumptions apply to all resource categories; any specific resource assumptions are provided in the methods of analysis section for that resource:

- Sufficient funding and personnel would be available for implementing the final decision.
- Implementation-level actions necessary to execute the RMP level decisions in this SEIS would be subject to further environmental review, including that under NEPA.

- Direct impacts of implementing the RMPA/EIS would primarily occur on public lands administered by the BLM in the planning area. Indirect impacts of implementing the Proposed RMPA/Final EIS could occur on either BLM-administered lands, or adjacent lands, regardless of ownership/administration. The discussion of impacts is based on best available science and data. Knowledge of the planning area, decision area, and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used for environmental impacts where data are limited.
- Restrictions (such as siting, design, and mitigation measures) would apply, where appropriate, to surface-disturbing activities associated with land use authorizations and permits issued on BLM-administered lands and federal mineral estate.
- GIS data have been used in developing acreage calculations and to generate the figures in **Appendix A**. Calculations depend on the quality and availability of data. Acreage figures and other numbers are approximate projections for comparison and analysis only; readers should not infer that they reflect exact measurements or precise calculations. In the absence of quantitative data, best professional judgment was used. Impacts were sometimes described using ranges of potential impacts, or they were described qualitatively, when appropriate.

The effects analysis from the 2015 Final EIS for the applicable portions of the Proposed Plan are carried forward into this SEIS. The No-Action Alternative for this SEIS was identified as the Proposed Plan in the 2015 Final EIS. The 2012 Governor's plan was identified as Alternative E in the 2015 Final EIS. The effects of the changes proposed in the Management Alignment Alternative were generally within the range of impacts identified among the alternatives considered in the 2015 Final EIS.

4.3 General Method for Analyzing Impacts

Potential impacts are described in terms of type, context, duration, and intensity, which are generally defined below.

Type of impact—Impacts are characterized using the indicators described in the 2015 Final EIS (where applicable). The presentation of impacts for key planning issues is intended to provide the BLM decision maker and reader with an understanding of the multiple use trade-offs associated with each alternative.

Context—This describes the area or site-specific, local, planning area-wide, or regional location where the impact would occur. Site-specific impacts would occur at the location of the action; local impacts would occur in the general vicinity of the action area; planning area-wide impacts would affect a greater portion of decision area lands in Nevada and northeast California; and regional impacts would extend beyond the planning area boundaries.

Duration—This describes the associated time period of an impact, either short term or long term. Unless otherwise noted, short-term is defined as anticipated to begin and end within the first 5 years after the action is implemented; long-term is defined as lasting beyond 5 years to the end of or beyond the life of this SEIS.

Intensity—Rather than categorize impacts with qualitative statements (e.g., major, moderate, or minor), this analysis discusses impacts using quantitative data wherever possible.

Direct and indirect impacts—Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place; indirect impacts result from implementing an action or alternative but usually occur later in time or are removed in distance and are reasonably certain to occur.

For ease of reading, the impacts of the management actions for a particular alternative on a specific resource are generally compared with the status quo or baseline for that resource; however, in order to properly and meaningfully evaluate the impacts under each alternative, its expected impacts should be measured against those projected to occur under the No-Action Alternative. This alternative is the baseline for comparing the alternatives to one another. This is because it represents what is anticipated to occur should the RMPA/EIS not be implemented.

Irreversible and irretrievable commitment of resources is discussed in **Section 4.12**, below. Irreversible commitments of resources result from actions in which resources are considered permanently changed; irretrievable commitments of resources result from actions in which resources are considered permanently lost.

4.3.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The impacts of the No-Action Alternative, or current management, of this SEIS were analyzed as the Proposed Plan in the 2015 Final EIS, and within the various alternatives analyzed in the Sagebrush Focal Areas Withdrawal Draft EIS (2016 SFA Draft EIS; BLM 2016b). The BLM has reviewed new information to verify that the analysis in the 2015 Final EIS remains sound; therefore, impacts from implementing the No-Action Alternative are substantially the same as those analyzed in the 2015 Final EIS.

Table 4-1, below, shows where information on the impacts of the No-Action Alternative can be found.

Table 4-1
Environmental Consequences for the No-Action Alternative Incorporated by Reference

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Habitat Management Area (HMA) Boundaries	Greater Sage-Grouse	The impacts on Greater Sage-Grouse and its habitat through the management of established HMAs are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51.
	Vegetation	The impacts on Vegetation through the management of the established HMAs are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	The impacts on Land Use and Realty through the management of the established HMAs are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The impacts on Renewable Energy through the management of the established HMAs are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.
	Minerals and Energy	The impacts on Minerals and Energy through the management of the established HMAs are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	The impacts on Socioeconomics through the management of the established HMAs are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Habitat Management Area (HMA) Boundaries *(continued)*	Livestock Grazing	The impacts on Livestock Grazing through the management of the established HMAs are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The impacts on Comprehensive Travel Management through the management of the established HMAs are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Sagebrush Focal Areas (SFA)	Greater Sage-Grouse	The impacts on Greater Sage-Grouse from withdrawing SFAs from location and entry under the Mining Law of 1872 are discussed in the 2016 SFA Draft EIS, Section 4.5 of the 2015 Final EIS beginning on page 4-82.
	Vegetation	The impacts on Vegetation from withdrawing SFAs from location and entry under the Mining Law of 1872 are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91 and the 2016 SFA Draft EIS, Section 4.4 Vegetation, including Special Status Plants, beginning on page 4-68.
	Land Use and Realty	The impacts of establishing SFAs on Land Use and Realty are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The impacts of establishing SFAs on Renewable Energy are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.
	Minerals and Energy	The impacts of establishing SFAs on Minerals and Energy are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286 and the 2016 SFA Draft EIS, Section 4.2 Geology and Mineral Resources, beginning on page 4-7.
	Socioeconomics	The impacts of establishing SFAs on Socioeconomics are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402 and the 2016 SFA Draft EIS, Section 4.3 Social and Economic, beginning on page 4-20.
	Livestock Grazing	The impacts of establishing SFAs on Livestock Grazing are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The impacts of establishing SFAs on Comprehensive Travel Management are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Adaptive Management	Greater Sage-Grouse	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Greater Sage-Grouse through the application of the established Adaptive Management Plan are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51.
	Vegetation	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Vegetation through the application of the established Adaptive Management Plan are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Land Use and Realty through the application of the established Adaptive Management Plan are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Renewable Energy through the application of the established Adaptive Management Plan are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Adaptive Management *(continued)*	Minerals and Energy	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Minerals and Energy through the application of the established Adaptive Management Plan are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Socioeconomics through the application of the established Adaptive Management Plan are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.
	Livestock Grazing	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Livestock Grazing through the application of the established Adaptive Management Plan are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The Adaptive Management Plan analyzed in 2015 can be found in Section 2.7.1 of the 2015 Final EIS. The impacts on Comprehensive Travel Management through the application of the established Adaptive Management Plan are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Allocation Exception Process	Greater Sage-Grouse	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Greater Sage-Grouse through the management of the established Allocation Exception Process are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51.
	Vegetation	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Vegetation through the management of the established Allocation Exception Process are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Land Use and Realty through the management of the established Allocation Exception Process are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Renewable Energy through the management of the established Allocation Exception Process are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Allocation Exception Process *(continued)*	Minerals and Energy	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Minerals and Energy through the management of the established Allocation Exception Process are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Socioeconomics through the management of the established Allocation Exception Process are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.
	Livestock Grazing	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Livestock Grazing through the management of the established Allocation Exception Process are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	A number of exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this SEIS under the heading Issue: Allocation Exception Process, under the No-Action Alternative. The impacts on Comprehensive Travel Management through the management of the established Allocation Exception Process are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Mitigation	Greater Sage-Grouse	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Greater Sage-Grouse through the management of the established mitigation are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51. The Regional Mitigation Strategy is explained in Appendix I of the 2015 Final EIS.
	Vegetation	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Vegetation through the management of the established mitigation are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Land Use and Realty through the management of the established mitigation are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Renewable Energy through the management of the established mitigation are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Mitigation *(continued)*	Minerals and Energy	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Minerals and Energy through the management of the established mitigation are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Socioeconomics through the management of the established mitigation are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.
	Livestock Grazing	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Livestock Grazing through the management of the established mitigation are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The mitigation strategy that constitutes the action under this alternative is described in Section 2.7.3 of the 2015 Final EIS beginning on page 2-88. The impacts on Comprehensive Travel Management through the management of the established mitigation are discussed in section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Seasonal Timing Restrictions	Greater Sage-Grouse	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Greater Sage-Grouse through the management of the established seasonal timing restrictions are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51.
	Vegetation	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Vegetation through the management of the established seasonal timing restrictions are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Land Use and Realty through the management of the established seasonal timing restrictions are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Renewable Energy through the management of the established seasonal timing restrictions are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Seasonal Timing Restrictions *(continued)*	Minerals and Energy	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Minerals and Energy through the management of the established seasonal timing restrictions are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Socioeconomics through the management of the established seasonal timing restrictions are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.
	Livestock Grazing	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Livestock Grazing through the management of the established seasonal timing restrictions are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The seasonal timing restrictions are tied to specific seasonal habitat needs for Greater Sage-Grouse. The discussion related to these restrictions is found in Management Action SSS-2 of the 2015 Final EIS beginning on page 2-20. The discussion specific to seasonal timing restrictions begins on page 2-23. The impacts on Comprehensive Travel Management through the management of the established seasonal timing restrictions are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.
Habitat Objectives	Greater Sage-Grouse	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Greater Sage-Grouse through the management of the established Habitat Objectives are discussed in Section 4.4.10 of the 2015 Final EIS beginning on page 4-51.
	Vegetation	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Vegetation through the management of the established Habitat Objectives are discussed in Section 4.5.10 of the 2015 Final EIS beginning on page 4-91.
	Land Use and Realty	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Land Use and Realty through the management of the established Habitat Objectives are discussed in Section 4.13.10 of the 2015 Final EIS beginning on page 4-269.
	Renewable Energy	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Renewable Energy through the management of the established Habitat Objectives are discussed in Section 4.14.10 of the 2015 Final EIS beginning on page 4-284.

Issue	Resource / Resource Use	Location of Impact Analysis from the 2015 Final EIS
Habitat Objectives *(continued)*	Minerals and Energy	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Minerals and Energy through the management of the established Habitat Objectives are discussed in Section 4.15 of the 2015 Final EIS beginning on page 4-286.
	Socioeconomics	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Socioeconomics through the management of the established Habitat Objectives are discussed in Section 4.21 of the 2015 Final EIS beginning on page 4-402.
	Livestock Grazing	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Livestock Grazing through the management of the established Habitat Objectives are discussed in Section 4.10.10 of the 2015 Final EIS beginning on page 4-232.
	Comprehensive Travel Management	The habitat objectives are discussed in Section 2.6.2 under Objective SSS-1 and the Habitat Objectives (Table 2-2) in the 2015 Final EIS beginning on page 2-17. The impacts on Comprehensive Travel Management through the management of the established Habitat Objectives are discussed in Section 4.12.10 of the 2015 Final EIS beginning on page 4-252.

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This table is a summary of the environmental consequences from the 2015 alternatives that were incorporated by reference into the 2019 planning effort and considered throughout the process. **Table 4-2** presents a comparison summary of impacts from management actions proposed for the alternatives considered in 2015.

Table 4-2
Summary of Environmental Consequences

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Greater Sage-Grouse						
Continued implementation of BLM vegetation and soil management policies and standards in sagebrush habitat would decrease invasive species, help re-establish native plants, reduce the risk of wildfire, and reduce juniper and/or pinyon and invasive grasses, leading to a long-term improvement in quality and quantity of Greater Sage-Grouse habitat. Continuation of national and local livestock management plans and policies would not specifically protect Greater Sage-Grouse habitat, though they could provide indirect benefits through preservation of existing sagebrush habitat. Management of riparian areas to achieve PFC would improve Greater Sage-Grouse brood-rearing habitats. Range improvements would be designed to meet range and wildlife objectives, which could protect Greater Sage-Grouse habitats. Most LUPs do not include provisions for managing fires and fuels to protect Greater Sage-Grouse habitat. Under Alternative A, wildfires would likely continue to increase in size and frequency in seven of the nine populations/subpopulations in the sub-region. Greater Sage-Grouse would subsequently continue to be degraded or lost. Small and heavily disturbed populations with dominance of invasive grass understory would be particularly susceptible to these impacts. Wild horses and burros would continue to be managed on HMAs/WHBTs, but management	Alternative B management prescriptions for vegetation and soil applied to PHMA (9,573,300 acres) and GHMA (6,953,300 acres) would provide greater protection and restoration efforts for Greater Sage-Grouse habitat compared with Alternative A. Under Alternative B, the same number of acres would be open to livestock grazing as under Alternative A. In comparison with Alternative A, Alternative B management actions would further reduce, but would not eliminate, impacts from livestock grazing on Greater Sage-Grouse and its habitat. Under Alternative B, impacts on Greater Sage-Grouse from fire suppression activities would be largely the same as Alternative A. Relative to the amount of Greater Sage-Grouse habitat that is expected to burn based on current trends and is outside the control of the BLM or Forest Service, Alternative B may provide localized but minimal protections and improvements to Greater Sage-Grouse habitat. Alternative B provides significant short-term and localized improvements to grass cover and forb availability from changes in wild horse and burro management, compared with Alternative A. Fluid minerals management under Alternative B would close 10,120,700 acres of PHMA to leasing. Withdrawal from mineral leasing would result in long-term beneficial impacts on Greater Sage-	Management under Alternative C would not prioritize restoration treatments within occupied habitats; therefore, it would decrease the potential for restoring Greater Sage-Grouse habitat, compared with Alternative A. Livestock use would be closed on about 16,526,600 acres of PHMA. Under Alternative C, impacts on Greater Sage-Grouse would be reduced compared with Alternative A in upland sites but increased in riparian sites. Removal of fencing would reduce the potential of Greater Sage-Grouse direct strikes but would increase negative impacts on brood-rearing habitats from wild horses and burros having access to more riparian sites. Impacts on Greater Sage-Grouse from wildfire suppression and fuels management would be the same as Alternative B. Under Alternative C, wild horses and burros would be managed on the same HMA/WHBT acreage as under Alternative A. However, horses and burros would be expected to range over a larger area than under Alternative A and would cause greater adverse impacts on quality Greater Sage-Grouse habitat. Under Alternative C, fluid mineral leasing would be precluded for all ACECs, including all PHMA. Closed acreage would protect all occupied or potentially occupied Greater Sage-Grouse habitat.	Management under Alternative D would focus on vegetation management within PHMA and GHMA with a goal of maintaining a resilient sagebrush vegetative community, restoring sagebrush communities to reduce habitat fragmentation, and maintaining and re- establishing habitat connectivity over the long term. Habitat trends for 10 and 50 years would improve compared with Alternative A and would be similar to Alternative B. Compared with Alternative A, Alternative D livestock management actions would further reduce, but would not eliminate, impacts from grazing on Greater Sage-Grouse and its habitat. Impacts from wildfire and fuels management are expected to be similar to but slightly less than Alternative B due to the fact that fuels management treatments and post-fire rehabilitation projects in PHMA are focused on maximizing benefits to Greater Sage-Grouse. Similar to Alternative B, wild horse and burro management under Alternative D provides significant, short-term, and localized improvements to grass cover and forb availability. Alternative D would allow fluid mineral leasing on all lands with federal fluid mineral estate, but within PHMA and GHMA, leasing would only be allowed with NSO stipulations. NSO stipulations would provide an increased level of protection to all acres of PHMA and GHMA compared with Alternative A.	In comparison with Alternative A, Alternative E would provide greater benefits to Greater Sage-Grouse and its habitats by establishing regulatory mechanisms that would provide protections for Greater Sage-Grouse on lek or nesting habitat. Riparian impacts would be expected to be reduced in comparison to Alternative A. Management under Alternative E would provide for more vegetation treatments within occupied Greater Sage-Grouse habitat than under Alternative A, similar to Alternatives B and D. Ten and fifty-year habitat trends would improve compared to Alternative A and would be similar to Alternatives B and D. Livestock grazing management under Alternative E would emphasize cooperative implementation of appropriate prescribed grazing conservation actions at scales sufficient to influence a positive response in Greater Sage-Grouse habitat. Riparian areas would be managed, at a minimum, for PFC. BLM riparian areas would be managed to meet RAC standards. Alternative E would promote riparian grazing improvements along with additional infrastructure in order to control season, duration, and degree of use. These improvements would be beneficial to late summer brood-rearing habitat for Greater Sage-Grouse. Effects from wildfire suppression and fuels management would be	Vegetation management under Alternative F would provide about the same level of, or slightly less, protection to Greater Sage-Grouse and its habitat as Alternative B. In comparison with Alternative A, livestock management under Alternative F would provide more indirect benefits to Greater Sage-Grouse due to increases in nesting and brood-rearing habitat amount and quality. Alternative F may increase some direct impacts on nesting Greater Sage-Grouse when compared with Alternative A by not applying timing restrictions to livestock during Greater Sage-Grouse nesting periods. This is likely offset by closure of 25 percent of each planning area to livestock grazing each year and a 25 percent reduction in AUMs and removal of certain livestock-related structures such as fences. Effects on Greater Sage-Grouse from wildfire and fuels management would be the same as Alternative B. Under Alternative F, AML for wild horses and burros would be reduced by 25 percent in all HMAs and WHBTs in Greater Sage-Grouse habitat. All other management would be the same as under Alternative B. Leasable minerals management under Alternative F would close PHMA and GHMA to fluid mineral leasing, as under Alternative C. Impacts from locatable minerals management would be the same as for Alternative B. Impacts from	***Vegetation*** Management for vegetation under the Proposed Plan would increase the amount and quality of Greater Sage-Grouse habitat compared with Alternative A and similar to Alternative D for all Greater Sage-Grouse seasonal life-cycle requirements, including breeding, nesting, brood-rearing, and wintering. Management would be focused in PHMA and GHMA with a goal of maintaining a resilient sagebrush vegetative community, restoring sagebrush communities to reduce habitat fragmentation, and maintaining and re-establishing habitat connectivity over the long term. ***Livestock*** These management actions would speed recovery of negatively impacted Greater Sage-Grouse habitats as compared with Alternative A. Direct impacts on breeding and/or nesting Greater Sage-Grouse individuals and habitats would also be reduced due to the use of various herd management actions (e.g., seasonal timing restrictions) applied during the Greater Sage-Grouse breeding and nesting season as compared to Alternative A. Removing livestock ponds outside of perennial waterways and requiring salting locations and range facilities to be moved farther away from riparian areas, springs, and meadows would reduce long-term negative impacts on riparian brood-rearing habitats.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
would not be based specifically on the habitat needs of Greater Sage-Grouse. Keeping horses and burros at AML would reduce overall impacts on vegetation, especially nesting cover and riparian brood-rearing habitats, during periods of drought. Currently 1,884,300 acres of PHMA and GHMA are closed to fluid minerals leasing. Lands closed to mineral entry comprise 521, 600 acres of PHMA and GHMA. There are 1,884,300 acres closed to mineral material disposal within PHMA and GHMA. Closed areas provide an increased level of protection to nesting habitat associated with leks. Under current land use and realty management, ROW exclusion would affect 1,884,300 acres of Greater Sage-Grouse habitat. Acres of PHMA and GHMA identified as available for disposal total 766,300 under Alternative A. Under this alternative, ROW exclusion and avoidance management would be expected to continue to reduce both direct and indirect impacts on Greater Sage-Grouse. Under Alternative A, 1,884,300 acres are managed for exclusion and 0 acres are managed for avoidance of wind energy within existing PHMA/GHMA. Under Alternative A, 521,600 acres of PHMA and GHMA would be closed to motorized vehicle use.	Grouse habitats associated with all seasonal life history requirements. Under Alternative B, management of locatable minerals would be more protective of Greater Sage-Grouse habitat than under Alternative A. Proposed withdrawals from mineral entry under Alternative B would include 9,342,600 acres of PHMA. Within modeled nesting habitat there would be 10,522,300 acres of PHMA. Alternative B closes 10,120,700 acres of PHMA to mineral material sales. Closing PHMA to leasing, entry, and sales would provide an increased level of protection to Greater Sage-Grouse and its habitat during all seasonal life- cycle requirements. Under Alternative B, more habitat would be managed as ROW avoidance (6,470,600 acres) and exclusion (10,056,000 acres) areas than under Alternative A. Impacts on Greater Sage-Grouse from lands and realty management would be reduced by greatly increasing acreage subject to ROW avoidance and exclusion and by protection and acquisition of important Greater Sage-Grouse habitats. Under Alternative B, impacts from management of lands for wind and solar energy development would be the same as for Alternative A. Under Alternative B, 521,600 acres of PHMA and GHMA would be closed to motorized vehicle use, and 9,599,100 acres would be limited to existing roads and trails. Compared to Alternative A, Alternative B would reduce the potential for vehicle disturbance to Greater Sage-Grouse within PHMA during all phases of their seasonal life history.	Mineral entry withdrawal would be proposed for PHMA and all ACECs, protecting all occupied or potentially occupied Greater Sage-Grouse habitat and providing an increased level of protection to all associated populations and sub-populations. Management under Alternative C would close PHMA (16,526,600 acres) to mineral material sales. Closure would increase protection of all acres of PHMA. Under Alternative C, ROW avoidance acres would remain the same as under Alternative A. Within PHMA, there are more acres managed as ROW exclusion under Alternative C (16,526,600 acres) than under Alternative A (1,884,300 acres). Under this alternative, fewer acres are identified for disposal and more areas are prioritized for acquisition. This alternative would result in fewer direct or indirect impacts on Greater Sage-Grouse and their habitats compared with Alternative A. Compared with Alternative A, Alternative C eliminates the impacts from renewable energy development on Greater Sage-Grouse and its habitat in all seasonal ranges. Under Alternative C, any designated open roads within PHMA would be managed as limited for motorized travel with the exception of existing closed areas within PHMA.	Impacts on Greater Sage-Grouse habitat from locatable minerals management would be the same as under Alternative A. Impacts on Greater Sage-Grouse habitat from salable minerals management would be the same as under Alternative C. Applying avoidance criteria throughout PHMA and GHMA would result in greater control of impacts on Greater Sage-Grouse in these habitats than would occur under Alternative A. ROW exclusion areas would be the same as under Alternative A; therefore, these impacts would be expected to be the same. Under Alternative D, all PHMA and GHMA would be managed as ROW exclusion for wind facilities. This level of closure provides the maximum preservation of sagebrush habitat. Under Alternative D, PHMA and GHMA would be managed as ROW exclusion for new solar energy facilities. This would provide a high level of protection for sagebrush, excluding 22,245,600 acres of Greater Sage-Grouse habitat from new development. Under Alternative D, areas designated as open to cross-country travel within PHMA and GHMA would be managed as limited to motorized travel, making it the most limiting to travel management designations.	similar to the effects described under Alternative D but would emphasize economic incentives to promote rehabilitation and restoration activities. Impacts from wild horse and burro management under Alternative E would be similar to Alternatives B and D. Management under Alternative E would allow leasing within the SGMA on all lands with federal fluid mineral estate. This would include moderate stipulations (TL and CSU) and would be subject to avoid, minimize, and mitigate policy. Under Alternative E, lands would be generally open to mineral location, except if already withdrawn under current management. Effects on Greater Sage-Grouse populations and habitat would be similar to Alternative A. Management under Alternative E would avoid mineral material sales within the SGMA and apply a policy of avoid, minimize, and mitigate. The Nevada Conservation Credit System would be implemented. Existing withdrawn acreage, avoidance, and implementation of the avoid, minimize, and mitigate policy would provide an increased level of protection to all acres of Greater Sage-Grouse habitats. Impacts from lands and realty management would be similar to Alternative D, establishing core and priority habitats within SGMA as avoidance areas subject to an avoid, minimize, and mitigate strategy, which would reduce direct and indirect impacts on Greater Sage-Grouse and its habitat. Under Alternative E, renewable energy management would site projects outside of Greater Sage-Grouse habitat wherever possible.	salable minerals management would be the same as for Alternative A. Lands and realty management would be expected to provide greater direct protections to Greater Sage-Grouse than Alternative A due to the larger number of acres managed as ROW exclusion. Indirect impacts on habitat would be expected to also be less than Alternative A. For example, all PHMA would be managed as ROW exclusion for new permits, with exceptions for co- location of projects within existing footprints and valid, existing rights. Under Alternative F, solar development would be the same as Alternative A, and the same nature and scope of impacts would be expected. Under Alternative F, wind energy development would be the same as under Alternative D, and solar energy development would be the same as under Alternative A. Impacts from travel and transportation management would be the same as under Alternative B.	***Fire and Fuels*** Incorporation of the FIAT and Resistance and Resilience concepts would reduce impacts from invasive annual grasses and altered fire regimes on the sagebrush ecosystem as well as reduce the rate of conifer encroachment in order to reduce Greater Sage-Grouse habitat fragmentation and maintain or re-establish habitat connectivity over the long term and at a landscape scale compared with Alternative A. Fuel breaks would also be implemented to better contain wildfires, and during firefighting operations, sagebrush habitat would be protected, to the extent possible, as a valuable resource, increasing protection to Greater Sage-Grouse habitats from wildfire as compared with Alternative A. ***WHB*** As with livestock grazing, these reductions would be expected to provide long-term benefits to Greater Sage-Grouse and its habitat by increasing the overall quality of riparian and upland habitats through increased diversity and availability of vegetation, as well as reducing potential direct impacts on Greater Sage-Grouse from wild horse and burros, compared with Alternative A. ***Fluid Minerals*** This alternative affords increased protection of all seasonal Greater Sage-Grouse habitats from disturbance, decreases fragmentation, and reduces disturbance from structures and noise as compared to Alternative A. NSO stipulations within PHMA and SFAs would prohibit occupancy and all surface- disturbing activities on all or part of the lease for the life of the lease. The NSO would protect more acres of PHMA than

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
				Because this strategy would not rule out the construction of projects within or adjacent to Greater Sage-Grouse habitat, there would be the possibility for more land use for both wind and solar energy development than under Alternative A. Impacts from travel and transportation management would be the same as under Alternative D.		under Alternative A. Direct and indirect impacts on Greater Sage-Grouse individuals, populations, and habitat within the NSO would be reduced under the Proposed Plan. Under the Proposed Plan, within PHMA and GHMA on leases not yet developed, proposed surface disturbances must achieve a net conservation gain of Greater Sage-Grouse habitat. This requirement would ensure that Greater Sage-Grouse habitats within or outside of Greater Sage-Grouse habitats are restored to meet Greater Sage-Grouse habitat objectives (**Table 2-2**). A 3 percent disturbance cap would also be applied in PHMA. Seasonal restrictions would be applied to exploratory drilling in PHMA and GHMA, minimizing and/or eliminating direct impacts on individual Greater Sage-Grouse, populations, and habitat as compared with Alternative A. ***Locatable Minerals*** The Proposed Plan is the similar to Alternatives D and E but includes additional management actions and RDFs that would be applied consistent with applicable law. Management under the Proposed Plan would decrease direct and indirect impacts on Greater Sage-Grouse and its habitat by eliminating noise impacts to Greater Sage-Grouse during the breeding season as compared with Alternative A. ***Salable*** Management under the Proposed Plan would close PHMA to new material disposal. RDFs to conserve and maintain the quality and distribution of Greater Sage-Grouse habitat would be applicable within all Greater Sage-Grouse habitats consistent with applicable law, minimizing or eliminating

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
						disturbance to Greater Sage-Grouse and its habitat from surface disturbance, noise impacts, West Nile virus, and habitat fragmentation, in addition to a 3 percent disturbance cap in PHMA and a net conservation gain of Greater Sage-Grouse habitat compared with Alternative A. ***Lands and Realty*** The management actions under the Proposed Plan would reduce the number of developments within proximity of leks and other seasonal habitats where Greater Sage-Grouse are most susceptible to aerial predators. Major and minor ROWs would be managed as avoidance areas in PHMA. In GHMA, major ROWs would be managed as avoidance and minor ROWs would be managed as open. The TransWest Express Transmission project is not subject to the decisions made in this planning effort. Co-locating power and communication lines or siting in non-habitats and application of the net conservation gain goal would decrease direct disturbance to Greater Sage-Grouse habitat. Noise and seasonal restrictions would reduce disturbance to Greater Sage-Grouse during the breeding season as compared with Alternative A. ***Renewable Energy*** Under the Proposed Plan, PHMA would be managed as exclusion areas for wind energy facilities. More acres (over 11 million additional acres) would be excluded under the Proposed Plan than under Alternative A. Fewer direct and indirect impacts on Greater Sage-Grouse and all of its seasonal habitats would be afforded under the Proposed Plan than under Alternative A.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
						Solar Under the Proposed Plan, PHMA and GHMA would be managed as exclusion areas for utility-scale commercial solar energy facilities. This represents over 8 million fewer acres open to solar energy development than under Alternative A. Fewer direct and indirect impacts on Greater Sage-Grouse and all of its seasonal habitats would be afforded under the Proposed Plan than under Alternative A. ***Travel*** Under the Proposed Plan, no acres would be open to motorized travel, and the BLM would manage over 16 million acres as limited to existing or designated routes. No new roads would be allowed in PHMA or upgrades of existing routes. Seasonal timing restrictions could also be applied to roads near leks. The Proposed Plan would provide fewer impacts on Greater Sage-Grouse and its habitat than under Alternative A. ***ACEC*** Similar to Alternatives D and E, Greater Sage-Grouse management prescriptions would be extended over 115,300 acres of PHMA, GHMA, and OHMA in 29 existing ACECs. In addition, the recommendation for withdrawal of locatable minerals in SFAs would include some existing ACECs that are currently open to locatable materials. Direct and indirect impacts on Greater Sage-Grouse and its habitat would be less than under Alternative A.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Vegetation and Soils						
Integrated Vegetation Management Handbook policies would continue to be followed and would provide guidance on which treatments and chemicals can be used. Application of these policies would improve vegetation management in sagebrush habitat, thereby likely improving vegetation conditions in these areas. A greater acreage of sagebrush may be burned within PHMA areas since this alternative is the least restrictive on wildland fire management within PHMA and GHMA areas. As a result, a greater loss of vegetation could occur in sagebrush habitats. This could result in an increased risk of annual grass and noxious weed invasion due to the disturbance.	Large-scale disturbances within PHMA would not be permitted and small-scale disturbances would be limited to 3 percent surface disturbance. This would minimize disturbance to vegetation and soils. Soils and vegetation management actions under Alternative B would aim to improve vegetation conditions and prioritize restoration efforts to benefit sagebrush vegetation. As a result, the restoration and vegetation management actions would enhance vegetation beyond the extent and condition relative to Alternative A. Impacts on soils from livestock grazing management are likely to be the same as those identified under Alternative A. Fewer acres of sagebrush habitat would be converted to an early seral stage than under Alternative A. However, there could also be a greater potential for catastrophic fire as a result of fire suppression and exclusion.	This alternative relies more on passive restoration and would lead to fewer acres of vegetation management being treated compared with Alternative A. However, it is likely that more acres of crested wheatgrass seedings and cheatgrass-invaded areas would be treated, improving vegetative conditions for Greater Sage-Grouse habitat with success in those areas. With minimizing the use of herbicides to treat annual grasses and noxious weeds, fewer acres of treatment would be completed under this alternative compared with Alternative A. Perennial grass utilization levels of 10-15 percent could leave fine-fuel levels at a high risk for wildfire. Shrub integrity measures could leave sagebrush and other upland shrub species with little impact other than natural forces. All PHMA and GHMA closed to livestock grazing could show a reduction in the potential for invasive species establishment. This may not control or reduce the existing invasive species presence. Impacts from wildland fire management would be the same as those described under Alternative A.	Lands would be managed to meet Greater Sage-Grouse and habitat objectives and as a result, sagebrush/perennial grass ecosystems would be enhanced or maintained. With suppression efforts focused on PHMA and GHMA, more acres would likely burn in areas outside PHMA and GHMA, increasing the need for ESR treatments in non-Greater Sage-Grouse habitat. Grazing management to achieve vegetation composition and structure consistent with ecological site potential could maintain or enhance sagebrush and perennial grass conditions within PHMA. Drought management and livestock resting during the growing season would provide a more resilient plant community. Fewer acres of sagebrush habitat in PHMA and GHMA would be converted to an early seral stage, and would have less risk for invasive grass and noxious weed invasion than under Alternative A.	Alternative E uses the avoid, minimize, and mitigate concept to manage vegetation conditions in Greater Sage-Grouse habitat. This would limit disturbance to sagebrush/perennial grass communities and likely lead to improved health and vigor of this vegetation. Areas selected for mitigation would likely result in increased sagebrush/perennial grass vegetation communities. This alternative assigns the Nevada Sagebrush Ecosystem Council with establishment of policies for the identification and prioritization of landscape-scale enhancement, restoration, fuel reduction, and mitigation projects. Without knowing what actions would be taken by the Council, it cannot be determined fully what level of impacts would occur as a result of their policies. Grazing management to achieve vegetation composition and structure consistent with ecological site potential could maintain or enhance sagebrush and perennial grass conditions within the SGMA. Impacts from wildland fire management would be the same as under Alternative D. Under Alternative E, OHV routes would be designated to areas outside of the SGMA; disturbance from OHV use on vegetation and soils could be reduced in the SGMA through the avoidance, minimization, and mitigation of sagebrush/perennial grass communities.	Disturbance to sagebrush would be limited to 3 percent surface disturbance. This could maintain sagebrush/perennial grass vegetation communities within PHMA. Impacts from vegetation and soils management would be the same as those described under Alternative B, with the exception that this alternative would exclude livestock grazing from burned areas until woody and herbaceous plants achieve Greater Sage-Grouse habitat objectives. This would accelerate burned area recovery towards meeting Greater Sage-Grouse habitat requirements. Wild horse AMLs would be reduced by 25 percent within occupied Greater Sage-Grouse habitats. While impacts from wild horses and burros would remain, this would reduce the effects of wild horses described under Alternative A. Impacts from wildland fire management would be the same as under Alternative B. Limiting motorized travel to existing routes under Alternative F would minimize disturbance of vegetation and soils from vehicle traffic within the planning area.	Under the Proposed Plan, comprehensive strategies to manage Greater Sage-Grouse habitat across the planning area would result in sagebrush/perennial grass communities being improved or protected in comparison to Alternative A. Numerous strategies to control invasive weeds and treat hazardous fuels would help to improve the resiliency to disturbance and resistance to exotic plant invasion. Encroaching conifers would be removed in historic sagebrush sites. Invasive or noxious weed populations would be reduced. Limited disturbance due to restricting permitted actions would lead to improved vegetation conditions. Also, limited disturbance of soils due to restricting permitted actions would lead to biological soils crusts being maintained or improved. Establishment of sagebrush focal areas would lead to large blocks of sagebrush/perennial grass communities, and treatments would be prioritized to maintain or improve those stands. Integrated vegetation management at a landscape level is expected to improve the condition of public lands. In addition, increased emphasis on incorporation of Greater Sage-Grouse habitat objectives and considerations into programs such as livestock grazing, recreation, and wild horse and burro management would likely lead to improvements in overall vegetation conditions. The avoid, minimize, and apply compensatory mitigation strategy proposed for anthropogenic activities in Greater Sage-Grouse habitat under the Proposed Plan would reduce or eliminate both direct and indirect adverse impacts on vegetation and soils across the planning area.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Riparian Areas and Wetlands						
Overall, condition and trend of important riparian areas and wetlands within PMUs would likely continue to improve. For example, many programs designed to improve watershed function (fire and fuels, vegetation, livestock and wild horse and burro management) would continue to result in improvement in condition and trend of riparian areas and wetlands within the sub-region. As a result of livestock grazing management, condition and trend of riparian areas and wetlands in PHMA and GHMA are likely to continue to improve in portions, but not all, of the sub-region. Riparian areas and wetlands could potentially be impacted from activities associated with leasing fluid minerals over the majority of the planning area, including PHMA and GHMA. Because ROW avoidance and exclusion areas make up a relatively small percent of PHMA or GHMA within the planning area, only limited areas of wetland and riparian habitats would continue to be protected from disturbance.	Comprehensive actions to reduce land disturbance in priority Greater Sage-Grouse habitats would substantially reduce potential for disturbance to riparian areas and wetlands within the planning area. Measures including closing or withdrawing large areas of priority Greater Sage-Grouse habitats to both leasable and locatable minerals exploration and development, adding stipulations to GHMA for most minerals programs, establishing ROW avoidance areas, limiting travel, requiring RDFs to be applied consistent with applicable law in PHMA and retaining Greater Sage-Grouse habitat in public ownership would benefit riparian areas and wetlands in comparison to Alternative A. Collectively, these measures would reduce direct and indirect adverse impacts on riparian areas from soil and vegetation loss, soil compaction, accelerated erosion, and invasive plant infestations. Retention of priority riparian habitats in public ownership would also preclude opportunities for future development of these important areas. Riparian areas in Greater Sage-Grouse habitats would also receive greater focus for livestock and for wild horse and burro management and for application of ecological restoration practices compared to Alternative A. Actions including remediating non-functional water developments, incorporating riparian habitat objectives into the planning process for livestock and wild horses, and placing more emphasis on managing both grazing and vegetation programs for watershed health would collectively improve condition and trend of riparian areas and	Alternative C provides for extensive protection of Greater Sage-Grouse habitat (including both PHMA and GHMA) through large-scale restrictions on livestock grazing, mining, travel, and energy development. Removing infrastructure such as fences and water developments is also proposed. Collectively, these measures would improve riparian habitats through natural healing and by reducing disturbance over a broad area compared to Alternative A. Proposed restoration of crested wheatgrass seedings and cheatgrass infestations, and reclamation of disturbed areas would also potentially provide indirect benefits to riparian areas through improved watershed function and resiliency. However, opportunities for collaborative livestock management affecting intermixed private lands could be reduced or eliminated. Since much priority riparian habitats occur on private lands, fewer acres of riparian habitats on these areas would benefit from targeted or prescriptive management approaches compared to Alternative A. In addition, a proposal to restrict use of helicopters for gathering wild horses could result in increased direct and indirect impacts to riparian areas as a result of fewer numbers of horses being gathered.	Under Alternative D, measures to protect and enhance priority Greater Sage-Grouse habitats and to reduce disturbance would improve condition and trend of riparian areas and wetlands throughout much of the planning area. Management, evaluation, and protection of Greater Sage-Grouse habitat would receive much more focus in comparison to Alternative A. Greater Sage-Grouse habitat needs would be prioritized in development of plans for both livestock grazing and for wild horses. Fuels, vegetative treatments, and fire suppression actions would all include strategies for enhancement and/or protection of Greater Sage-Grouse habitat. Management actions covering minerals, lands, and recreation would emphasize avoiding, reducing, or minimizing impacts on Greater Sage-Grouse habitats. Incorporation of RFDs consistent with applicable law into the planning and permitting process would further limit disturbance while providing for consideration of Greater Sage-Grouse habitat needs during reclamation for PHMA, GHMA, and OHMA. Collectively, these measures would have the effect of substantially reducing direct and indirect adverse impacts from disturbance on riparian areas and wetlands across the planning area in comparison to Alternative A. In addition, many more acres of riparian habitats would be improved under Alternative D.	Alternative E represents a comprehensive strategy to evaluate and manage Greater Sage-Grouse habitat and to reduce impacts from anthropogenic disturbance. If successful, innovative approaches, including use of a dedicated technical team to address Greater Sage-Grouse habitat issues, development of a mitigation banking and credit system to offset impacts, and greater focus on collaboration across jurisdictional lines, could increase opportunities for improvement of riparian areas and wetlands in Greater Sage-Grouse habitat than currently exist under Alternative A. A number of specific requirements included as part of the compensatory mitigation program add a level of certainty to the assertion that more acres of riparian habitats would be improved in comparison to Alternative A. However, Alternative E does not establish a disturbance cap and does not identify fixed areas for exclusion, potentially resulting in more disturbances to some riparian habitats compared to the Proposed Plan. In addition, exceptions tied to habitat values and feasibility could result in situations where impacts to some riparian areas are not avoided. Alternative E also incorporates provisions of the Eureka County Master Plan, which would limit flexibility in making adjustments in livestock grazing to benefit riparian areas and wetlands.	Alternative F is similar to Alternative B but is more comprehensive in scope. Additional restrictions on a wide range of land use activities affecting both renewable and nonrenewable resources would significantly reduce the potential to disturb riparian and wetlands habitats. In addition, designation of sagebrush reserves with further limitations on development and disturbance would result in additional protection of riparian resources. Proposed actions focused on restoration and remediation of damage or disturbance would also directly and indirectly benefit riparian areas and wetlands within the planning area. Collectively, these measures would result in more riparian and wetland habitat improvement compared with Alternative A. Alternative F generally reduces land disturbances and would result in fewer impacts on riparian habitats associated with a particular use compared with Alternative A. Impacts from Greater Sage-Grouse management on riparian areas and wetlands are similar to Alternative B, with additional emphasis on protecting priority Greater Sage-Grouse habitat. Added focus on both preserving habitat and limiting disturbance would result in more acres of riparian and wetland habitat being improved or protected in comparison to Alternatives A and B. Identifying no new water developments in occupied habitat unless they can be shown to benefit Greater Sage-Grouse and modifying existing developments to maintain the continuity of the predevelopment riparian area within Greater Sage-Grouse habitats could result in fewer	Comprehensive strategies to manage Greater Sage-Grouse habitat across the planning area would result in more acres of riparian areas and wetlands being improved or protected compared with Alternative A. Numerous actions to reduce threats from invasive weeds and catastrophic wildfires and to restore degraded plant communities through focused vegetative treatments would benefit riparian habitats by improving functionality and resiliency of surrounding watersheds. Where strategies are focused on limiting or mitigating disturbance in PHMA and GHMA through a screening process, more acres of riparian habitats would be protected or enhanced in comparison to Alternative A. In the case of SFA, all habitat (PHMA, GHMA and OHMA) would be protected from androgenic disturbance, while requirements for a net conservation gain for PHMA and GHMA would likely result in greater focus on restoring riparian areas and wetlands than currently exists. Providing for more of a collaborative approach to management of Greater Sage-Grouse habitat across jurisdictional boundaries would also benefit riparian areas, since many of these sites occur on private lands or on a combination of private and BLM-administered lands. Increased emphasis on incorporating Greater Sage-Grouse habitat needs into programs such as livestock grazing, recreation, travel, and wild horses and burros would likely focus greater management attention on restoring or protecting riparian habitats than currently exists. Better livestock grazing practices and/or reduced use from wild horses would allow for increases in growth and establishment of

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
	wetlands in Greater Sage-Grouse habitat compared to Alternative A.				impacts on riparian habitat than Alternative A. Increased focus on vegetation management for the benefit of Greater Sage-Grouse habitat would indirectly benefit riparian and wetland habitat by improving overall watershed health, resulting in greater benefits to these areas in comparison to Alternative A. Condition and trend of riparian habitats would likely improve under Alternative F as a result of a placing greater emphasis on livestock impacts on late summer brood-rearing habitat. Impacts on riparian areas and wetlands are similar to Alternatives A, B, and D. Wild horse and burro AMLs would be reduced by 25 percent within HMAs/WHBTs with occupied Greater Sage-Grouse habitat. While impacts from wild horses and burros would remain, this would reduce the effects of wild horses and burros described under Alternatives A, B, and D. Impacts from fluid minerals management would be the same as under Alternative B. Impacts from lands and realty management would be the same as under Alternative C. Travel management under Alternative F is similar to Alternative B, but with more focus on planning and on closing or remediating roads in priority habitat. These measures would reduce impacts on riparian areas and wetlands in comparison to Alternatives A and B.	riparian vegetation. Fewer direct impacts from travel and recreational uses would also lead to increases in riparian plant growth, recovery of compacted soils, and less opportunity for establishment of invasive weeds. The avoid, minimize, and apply compensatory mitigation strategy, including the 3 percent disturbance cap for anthropogenic activities in BSUs (limited exceptions apply in Nevada but not California) and the requirement for a net conservation gain, would reduce or eliminate both direct and indirect adverse impacts on riparian and wetland habitats in PHMA and GHMA. Where impacts on riparian areas cannot be avoided, they would be offset through compensatory mitigation programs, including the Conservation Credit System in Nevada (this program does not apply to California). Use of the Conservation Credit System would incentivize conservation and potentially result in improvement of many acres of riparian areas and wetlands across the planning area, especially on private lands. Implementing the adaptive management strategy proposed under the Proposed Plan would trigger changes in land uses based on habitat and population trends. Conceivably, this would focus management planning on achieving and maintaining Greater Sage-Grouse habitat objectives, including those identified for riparian areas and wetlands. Application of the Monitoring Framework for the Proposed Plan would also help to ensure a more consistent and effective monitoring and tracking system for both positive and negative changes to priority riparian habitats within Greater Sage-Grouse habitat.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Special Status Species						
Most of the management actions for Greater Sage-Grouse would be beneficial for the majority of sensitive species inhabiting the planning area. The possible exception would be species that require pinyon and juniper woodlands for at least part of their life-cycle requirements. The BLM and Forest Service acknowledge the requirements of pinyon and juniper obligate species may be contradictory to the restoration of sagebrush habitat for Greater Sage-Grouse, but management decisions would need to be made on a local case-by-case basis; therefore, this is not further discussed in this programmatic document.						
Wild Horse and Burros						
Impacts would continue to be the same as those identified in the individual LUP documents.	Protections afforded to Greater Sage-Grouse and its habitat would be expected to benefit and impact wild horse and burro populations. However, temporary or long-term management changes to wild horses and burros (e.g., reduction in AML, designation, removals, movement patterns, and forage access) may be necessary to achieve and maintain the desired project objectives. Allowance of vegetation treatments designed to conserve, enhance, or restore Greater Sage-Grouse habitat would also benefit wild horses and burros. Managing wild horses and burros and their habitat to protect and maintain PHMA could impact wild horses and burros whose HMAs/WHBTs overlap with these habitats. Prioritizing wild horse and burros gathers in those HMAs/WHBTs that overlap PHMA could impact population management activities within non-Greater Sage-Grouse HMAs/WHBTs. Managing livestock grazing to protect and maintain priority Greater Sage-Grouse habitat would be expected to benefit wild horses and burros where HMAs/WHBTs overlap with these habitats. Modification or elimination of watering sites in order to conserve Greater Sage-Grouse habitat could reduce water availability, resulting in potential need for reduction of wild horse and burro numbers within an HMA/WHBT.	Protections afforded to Greater Sage-Grouse and its habitat would be expected to benefit and impact wild horse and burro populations. However, temporary or long-term management changes to wild horses and burros (e.g., reduction in AML, designations, removals, movement patterns, and forage access) may be necessary to achieve and maintain the desired habitat condition. Impacts from vegetation management would be the same as under Alternative A. Elimination of livestock grazing within SUAs and reducing grazing levels within those areas that retain grazing use to protect and maintain occupied Greater Sage-Grouse habitat would benefit wild horses and burros where HMAs/WHBTs overlap with these habitats. Evaluation of AMLs and completing land health assessments may result in need to reduce wild horse and burro numbers within a HMA/WHBT to achieve Greater Sage-Grouse habitat needs. Restricting removal and population control techniques could hamper proper management. Alternative C would require more intensive management when compared to Alternative A. Alternative B would result in reduced disturbance (i.e., vegetation removal) when compared to Alternative A.	Protections afforded to Greater Sage-Grouse and its habitat would be expected to benefit and impact wild horse and burro populations. However, temporary or long-term management changes to wild horses and burros (e.g., reduction in AML, designations, removals, movement patterns, and forage access) may be necessary to achieve and maintain the desired habitat condition. Evaluation and prioritization of Greater Sage-Grouse habitat restoration treatments identified for PHMA or GHMA habitat would benefit wild horse and burro habitat. Associated landscape-scale management and surface disturbance restrictions would also benefit wild horse and burro habitat. Allowance of management treatments designed to conserve, enhance, or restore PHMA and GHMA habitats that benefit livestock would also benefit wild horses and burros. Authorization of new or modification of existing livestock watering sites that benefit or conserve PHMA and GHMA habitats would benefit wild horses and burros. Elimination of existing water sources that may be identified as impacting PHMA and GHMA habitats could reduce water availability resulting in potential need for reduction of wild horse and burro numbers within an HMA/WHBT. Fuels projects that protect and restore existing sagebrush ecosystems and associated PHMA	Alternative E represents a comprehensive strategy to evaluate and manage Greater Sage-Grouse habitat and to reduce impacts from anthropogenic disturbance. If successful, innovative approaches, including use of a dedicated technical team to address Greater Sage-Grouse habitat issues, development of a mitigation banking and credit system to offset impacts, and greater focus on collaboration across jurisdictional lines, could increase opportunities for improvement of Greater Sage-Grouse habitat than currently exist under Alternative A. Impacts from managing livestock grazing under Alternative E would be same as Alternative A. Fire management activities that protect, maintain, and improve sagebrush habitat would benefit wild horses and burros with HMAs/WHBTs that overlap these habitats. Prioritizing wild horse and burro gathers and population growth suppression to those HMAs/WHBTs that overlap SGMA habitat could impact population management activities in HMAs/WHBTs located outside of Greater Sage-Grouse habitat. Evaluation of HMA designations and their associated AMLs within the SGMA through completion of land health assessments may result in the need to reduce or eliminate wild horse and burro HMA/WHBT in order to achieve Greater Sage-Grouse habitat objectives.	Protections afforded to Greater Sage-Grouse and its habitat would be expected to benefit wild horses and burros where HMAs/WHBTs overlap with PHMA or GHMA. However, the long-term management change (i.e., 25 percent reduction in HMA/WHBT AMLs) would require prioritization of subsequent NEPA to implement these reductions. However, temporary or long-term management changes to wild horses and burros (e.g., reduction in AML, designations, removals, movement patterns, and forage access) may be necessary to achieve and maintain the desired habitat condition. Vegetation treatments designed to conserve, enhance, or restore Greater Sage-Grouse habitat would also benefit wild horses and burros. Managing livestock grazing to protect and maintain PHMA would benefit wild horse and burro habitats. To achieve Greater Sage-Grouse habitat objectives, reducing the AMLs of the established HMA/WHBTs within occupied habitat by 25 percent would reduce utilization levels and other impacts associated with wild horses and burros. Costs of wild horse and burro management would increase, due to a need for additional wild horse and/or burro gathers for removal and population growth suppression treatment to achieve and maintain the newly established AMLs. Reductions to this level could impact herd sustainability and	Protections afforded to Greater Sage-Grouse and its habitat would be expected to benefit and impact wild horse and burro populations. However, temporary or long-term management changes to wild horses and burros (e.g., reduction in AML, designations, removals, movement patterns, and forage access) may be necessary to achieve and maintain the desired habitat condition. Evaluation and prioritization of Greater Sage-Grouse habitat restoration treatments identified for SFA, PHMA or GHMA habitat would benefit wild horse and burro habitat. Associated landscape-scale management and surface disturbance restrictions would also benefit wild horse and burro habitat. Allowance of management treatments designed to conserve, enhance, or restore SFA, PHMA, and GHMA habitats that benefit livestock would also benefit wild horses and burros. Authorization of new or modification of existing livestock watering sites that benefit or conserve SFA, PHMA, and GHMA habitats would benefit wild horses and burros. Eliminating existing water sources that may be identified as impacting SFA, PHMA, and GHMA habitats could reduce water availability, resulting in potential need for reduction of wild horse and burro numbers within an HMA/WHBT. Fuels projects that protect and restore existing sagebrush

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
	Prioritizing the evaluation of AMLs and completing land health assessments may result in need for the reduction of wild horse and burro numbers within an HMA/WHBT in order to achieve Greater Sage-Grouse habitat objectives. Alternative B would require more intense management when compared to Alternative A. Alternative B would result in reduced disturbance (i.e., vegetation removal) when compared to Alternative A.		and GHMA habitats would benefit wild horses and burros where HMAs/WHBTs overlap with these habitats. Prioritizing wild horse and burro gathers to those HMAs/WHBTs that overlap PHMA and GHMA habitats could impact population management activities within non-Greater Sage-Grouse HMAs/WHBTs. Evaluation of AMLs may result in need for the reduction of wild horse and burro numbers within a HMA/WHBT to achieve Greater Sage-Grouse habitat objectives. Alternative D would require more intensive management when compared to Alternative A. Alternative D would result in reduced disturbance (i.e., vegetation removal) when compared to Alternative A.	Alternative E would require more intensive management when compared to Alternative A.	diversity, which could lead to changes in HMA/WHBT designation and long-term management in these occupied habitats. Prioritizing wild horse and burros gathers to those HMAs/WHBTs that overlap PHMA could impact population management activities within non-Greater Sage-Grouse HMAs/WHBTs. Modification or elimination of watering sites could reduce water availability, resulting in potential need for reduction of wild horse and burro numbers within a HMA/WHBT. Prioritizing the evaluation of AMLs, HMA designations, and completing land health assessments may result in need for the reduction or elimination of wild horse and burro populations within an HMA/WHBT in order to achieve Greater Sage-Grouse habitat objectives. Fuels treatments that protect existing sagebrush ecosystems and associated PHMA would benefit wild horses and burros where HMAs/WHBTs overlap with these habitats. Alternative F would require more intensive management when compared to Alternative A. Alternative F would result in reduced disturbance (i.e., vegetation removal) when compared to Alternative A.	ecosystems and associated SFA, PHMA, and GHMA habitats would benefit wild horses and burros where HMAs/WHBTs overlap with these habitats. Managing wild horse and burro populations and their habitat to achieve Greater Sage-Grouse habitat objectives within SFA, PHMA, and GHMA habitats could be expected to impact wild horses and burros whose HMAs/WHBTs overlap with these habitats. Prioritization of gathers within HMAs would directly and indirectly impact WHB. The following HMAs fall within SFAs: Owyhee, Little Owyhee, Rock Creek, and Massacre Lakes. These HMAs would have the highest priority for gathers each year to achieve and maintain AML. This focused management strategy would ensure that AML is maintained along with the necessary forage for the wild horses in these HMAs; however, it may increase the number of gathers needed to maintain AML, which could potentially increase the disturbance to the populations as well as possible disruption of herd dynamics. Prioritization could also put HMAs that fall within the lowest priority at risk for overpopulation; however, under this LUPA, provisions would allow for exceptions as needed for herd health-limiting impacts. Evaluation of AMLs and HMA/WHBT designations may result in the need to reduce wild horse and burro numbers within a HMA/WHBT to achieve Greater Sage-Grouse habitat objectives. The Proposed Plan when compared to Alternative A would require more intensive management, particularly within the boundaries of the SFA areas. The Proposed Plan would result in reduced disturbance (i.e.,

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
						vegetation removal) when compared to Alternative A.
Wildland Fire Management						
Few management actions would be applied specific to Greater Sage-Grouse habitat protection. Therefore, impacts on fire management would continue to vary across the planning area based on site- specific habitat objectives for other resource concerns.	Focusing fire suppression in PHMA and GHMA would impose some limits on fuels treatments in this area, resulting in a higher level of protection but reduced management options in this area. It would also increase costs for fire management programs as compared with Alternative A because aggressive suppression response to conserve and protect would require more suppression resources. Restricting surface-disturbing activities in PHMA would decrease the chance for human-caused ignition as well as potential annual grass vectors in PHMA. Fuels management projects in PHMA would be designed to reduce wildfire threats in the greatest area, thereby decreasing risk of high- intensity fire in PHMA in the long term. Restrictions on the location of fuel breaks and location of other fuels treatments, however, would reduce management options and would increase costs of fuel management.	Alternative C would generally, have the broadest restrictions on fuel management activities extending to all occupied habitat by limiting fuel treatments to the interface of human habitation, and existing disturbances. This would impact the fire program's ability to efficiently manage fuels and could increase costs of vegetation management and fire suppression. Broader restrictions on resource uses and a higher level of protection for all occupied Greater Sage-Grouse habitat than Alternative A would further reduce opportunities for human- caused fires. Prohibiting livestock grazing within occupied Greater Sage-Grouse habitat would increase fine fuels and fire risk throughout occupied habitat. Reducing vegetation treatments that mimic the natural fire effects would increase the FRCC, resulting in an increased potential for large, intense wildfires. This increased potential for large wildland fire would increase costs associated with both fire suppression and post fire rehabilitation. An increase in fire size would increase the exposure to firefighters and public to the inherent risks associated with firefighting.	Impacts would be similar to those described under Alternative B, but with an added emphasis on region-specific habitat needs and variations in requirements for specific Greater Sage-Grouse habitat types resulting in more site-specific variation in fire management impacts. Alternative D also places added emphasis to pre- suppression planning, prevention, and educational objectives for fire suppression personnel. Alternative D would generally have broader restrictions on resource use and the highest level of protection for all occupied Greater Sage-Grouse habitat than Alternative A. This would further reduce opportunities for human-caused fires. Impacts from vegetation management would be similar to those described under Alternative B. Impacts from livestock grazing management would be similar to those described under Alternative B. Emphasizing fuels and habitat treatments in PHMA would result in a long-term reduction in risk of high- intensity fire in these areas, of particular importance in FRCC III.	Alternative E represents a comprehensive strategy to evaluate and manage Greater Sage-Grouse habitat and to reduce impacts from anthropogenic uses. Management actions would allow for some level of fuels treatments, providing greater flexibility for wildfire management. This alternative places added emphasis on a comprehensive wildfire management program that engages all interagency partners (federal, state, and local) to reduce the threats of catastrophic wildfire, rapidly suppress wildfires, and rehabilitate lands damaged by wildfire. Achieving "no net unmitigated loss" of Greater Sage-Grouse habitat by implementation of a strategy to avoid, minimize, and mitigate impacts on Greater Sage-Grouse would cause a shift in FRCC to a more historical regime. As shrub and grass cover becomes more continuous and ground cover is higher, the risk for large uncharacteristic fires would increase. Impacts from vegetation management would be similar to those described under Alternative B. Management under Alternative E for riparian areas would lessen impacts from fire by providing technical assistance, project success monitoring, and financial support to areas across the state that were previously burned and currently threatened by fires due to noxious weed infestations or fire fuels. Prepositioning and preventative actions would increase the likelihood of successful fire management actions with response	Similar to Alternative B, this alternative would impose some limits on fuels treatments in this area, resulting in a higher level of protection but reduced management options. Alternative F also prioritizes fire suppression in only PHMA, while Alternative B includes both PHMA and GHMA. The effects would be the same as Alternative B, except there would be a slight reduction in fire suppression costs under this alternative. Maintaining or increasing sagebrush cover to at least 70 percent of the decision area may cause an increase in fire severity and size due to the increase in fuel loading over time. Alternative F also identifies the need to designate sagebrush reserves (e.g., ACECs and Special Conservation Areas), which would cause an increase in planning and implementation costs associated with special designations. Restrictions from vegetation management would impact the ability to efficiently manage fuels and could increase costs of vegetation management and limit fire suppression options. Impacts from livestock grazing management would be similar to those described under Alternative D.	Under the Proposed Plan, comprehensive strategies to manage Greater Sage-Grouse habitat across the planning area would result in more acres treated and protected than Alternative A. Impacts would be similar to those described under Alternative D, but with added emphasis on regional specific habitat needs and variations and requirements for specific Greater Sage-Grouse habitat types, resulting in more site-specific variation in fire management impacts. Additional fuels treatments and other habitat treatments would be permitted with an emphasis in maintaining, protecting, and expanding sagebrush ecosystems. Emphasis would be concentrated in PHMA; therefore, the long-term reduction in risk of high-intensity fire would occur in these areas, with particular importance to Condition Class II and III. Management under the Proposed Plan should also place added emphasis on pre-suppression planning prevention, fuels management, and educational objectives for fire suppression personnel as outlined in Appendix G [of the 2015 Final EIS], Greater Sage- Grouse Wildfire and Invasive Annual Grasses Assessment and Concepts of Resistance and Resilience (FIAT Report; Chambers et. al. In press.). This two-step process assesses the resistance to invasive species annual grasses and resilience after disturbance of those habitats to wildfire, cheatgrass invasion, and conifer species expansion. It then prioritizes focal habitats for conservation and restoration and identifies geospatially explicit management strategies to conserve Greater Sage-Grouse habitats. The

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
				to wildfire but would increase overall management costs. Fuels reduction treatments would be similar to Alternative D, with added emphasis on coordination of state and local agencies and individual landowners.		assessment process sets the stage for: 1a. Identification of Priority Areas for Conservation (PACs) 1b. Identification of Management Unit Applications of Invasives as described in Appendix G [of the 2015 Final EIS], page 4. Impacts on Fire Management would also be greater compared to Alternative D by adding more priority areas for fire suppression, fuels management, and post-fire rehabilitation, which would result in an increase in both fuels management and fire suppression costs and possibly increase fire fighter exposure and overall risk.
Livestock Grazing						
Management designed to address nonattainment of wildlife habitat standards would likely reduce permitted AUMs. Grazing management changes would include the timing, duration, or frequency of permitted use, including temporary closures. Current levels and seasons of use would continue pending completion of land health assessments. Forage availability may increase in the long term due to improved land health and forage productivity. Weed control treatments would increase forage availability in the long term by improving native plant productivity. Wildfire would remove livestock forage over the short term but can result in increases in forage post-fire. Impacts on livestock operations could also occur when a livestock grazing rest period is required following vegetation stabilization and rehabilitation treatments post-fire. These required rest periods may impact the ability of livestock	Land health assessments would be conducted on all allotments open to grazing; however, under this alternative, allotments overlapping PHMA would be the highest priority. Changes to permitted AUMs could occur on some or all PHMA habitat acres first. The effect would be less than under Alternative A due to the reduced area. Completion of land health assessments and permits would be prioritized within PHMA, particularly those with the best opportunity to conserve, enhance, or restore habitat for Greater Sage-Grouse. As a result, impacts on range management would be most likely to occur in these areas. Management actions (grazing decisions, AMP/Conservation Plan developments, or other agreements) to modify grazing management would be made to meet seasonal Greater Sage-Grouse habitat requirements Such changes would have the potential to decrease management options and, therefore, result in increased	No livestock grazing would be allowed on 16,526,600 acres in the decision area for a total of 0 AUMS in the decision area. This would force permittees/lessees to graze on private lands or give up their grazing operations.	Impacts from Greater Sage-Grouse management would be similar to those under Alternative A. Impacts from livestock grazing management would be greater than those under Alternative A. All PHMA and GHMA acres would be required to meet rangeland health standards, and range improvements would be evaluated to make sure they conserve, enhance, or restore Greater Sage-Grouse habitat. Wet meadow treatments may result in more restrictions to livestock grazing and the ability to continue existing terms and conditions of permits. Additional acres may be closed to grazing temporarily within allotments to allow for riparian areas and meadows to rest from grazing in order to improve vegetation composition for Greater Sage-Grouse habitat. Impacts from wildland fire management would be similar to those described under Alternative B.	Impacts from Greater Sage-Grouse management would be the similar to Alternative A. Alternative E stresses cooperative, seasonal adjustments to grazing use to ensure that they maintain or enhance the habitat in the SGMA. Under Alternative A, in contrast, BLM grazing permits are evaluated against Rangeland Health Standards, and grazing management changes must be implemented by the next grazing season, if necessary, when currently permitted use is determined to be causing a Greater Sage-Grouse habitat-related standard to be unmet or not making significant progress. Alternative E would result in positive impacts on Greater Sage-Grouse habitat in the SGMA where cooperation is present. Impacts from livestock grazing management would be the similar to Alternative A, as current BLM grazing management is required to meet many or all of the desired conditions outlined in Alternative E.	Impacts from Greater Sage-Grouse management would be the same as under Alternative A. This alternative rests 25 percent of occupied habitat each year. Also, utilization levels are limited to 25 percent. These actions would reduce permitted use drastically in occupied habitat. Range improvement construction would increase due to the need to fence out PHMA/GHMA areas from grazing use being permitted on adjacent areas. Impacts from vegetation management would be the same as under Alternative A. Impacts from wildland fire management would be the same as under Alternative A.	***BLM*** Impacts are similar to Alternative D, including impacts from meeting Greater Sage-Grouse habitat objectives in **Table 2-2**. All SFA, PHMA, and GHMA acres would be required to meet rangeland health standards, including Greater Sage-Grouse habitat objectives. However, management would be prioritized within allotments located within SFAs, followed by PHMAs and then GHMAS. This prioritization would require more intensive management of allotments that fall within these areas and reduce resources available for managing allotments outside of SFAs. Impacts are similar to Alternative D. The difference is that the designation of SFAs would require more intensive management of allotments that fall within these areas. All SFA, PHMA, and GHMA acres would be required to meet rangeland health standards,

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
operators to fully use permitted AUMs.	time and costs required for permittees/lessees. Vegetation restoration may directly affect livestock grazing if treatments include restrictions on available grazing acreage or changes to permitted AUMs, grazing strategies, or season of use, which could result in increased cost to permittees. Required rest periods following treatments may impact the ability of livestock operators to fully utilize permitted AUMs. Impacts could occur should treatments for Greater Sage-Grouse habitat not match with vegetation objectives for livestock grazing; however, in most cases, treatment would improve forage conditions in the long term. Measures to protect sagebrush habitat might reduce the spread of wildfire and the associated disruption to livestock operations. Forage availability would be maintained or increased long term. Mechanical, manual, and chemical treatments would be utilized to prevent confer encroachment and prevent the spread of undesirable annual grass and weed species. These actions could improve forage in the long term.			Impacts from vegetation management would be the same as under Alternative A. Impacts from wildland fire management would be the same as under Alternative B.		including Greater Sage-Grouse habitat standards. Range improvements would be evaluated to make sure they conserve, enhance, or restore Greater Sage-Grouse habitat. Wet meadow treatments may result in more restrictions to livestock grazing and the ability to continue existing terms and conditions of permits. Additional acres may be closed to grazing temporarily within allotments to allow for riparian areas and meadows to rest from grazing in order to improve vegetation composition for Greater Sage-Grouse habitat. Impacts from wildland fire management would be similar to those described under Alternative B. ***Forest Service*** The difference in impacts on livestock grazing under Forest Service management versus BLM management is that under the Forest Service Proposed Plan, term grazing permits would be amended with seasonal habitat restrictions in Greater Sage-Grouse habitat, resulting in additional adjustments in grazing strategies.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Recreation						
Existing recreation opportunities in the planning area would be maintained.	Only BLM SRPs and Forest Service SUPs that have neutral or beneficial effects would be allowed in approximately 9,599,100 acres of PHMA. This may restrict some types of permitted uses. As a result, some types of permitted activities (e.g., OHV races) that could negatively affect PHMA may be impacted, resulting in fewer opportunities to engage in those types of events and activities in those areas. However, opportunities for nonmotorized recreation, such as hiking, horseback riding, and hunting, in a more natural or primitive setting may be expanded and enhanced.	Impacts of Alternative C would be the same as under Alternative A.	Only BLM SRPs and Forest Service SUPs that have neutral or beneficial effects would be allowed on approximately 16,005,000 acres of both PHMA and GHMA. As a result, some types of permitted activities (e.g., OHV races) that could negatively affect PHMA/GHMA may be impacted, resulting in fewer opportunities to engage in those types of events and activities in those areas. Construction of new recreational facilities such as campgrounds, day-use facilities, and trailheads would be prohibited in PHMA and GHMA.	Impacts from Alternative E would be the same as under Alternative A.	Only BLM SRPs and Forest Service SUPs that have neutral or beneficial effects would be allowed on approximately 16,005,000 acres in PHMA. As a result, some types of permitted activities (e.g., OHV races) that could negatively affect PHMA/GHMA may be impacted, resulting in fewer opportunities to engage in those types of events and activities in those areas. Additional management actions that would seasonally prohibit camping and other nonmotorized recreation activities within four miles of active leks would decrease the area available for recreational opportunities such as camping, mountain biking, and hiking, resulting in seasonal reductions in recreational opportunities.	Impacts from the Proposed Plan would be the same as or similar to those under Alternative D, except the Proposed Plan would allow the construction of new recreation facilities in GHMA and construction of new recreational facilities in PHMA if there is a net conservation gain to Greater Sage-Grouse habitat such as diverting use away from critical areas.
Travel and Transportation Management						
The decision area is open to cross-country OHV travel except in areas designated as WSAs, WAs. In addition, all lands managed by CA BLM in the planning area and all forest service lands are limited to designated roads and trails. This provides greater than 12 million acres of open travel opportunities for OHV recreational users in the planning area.	There would be 5,739,500 acres in PHMA previously open to cross-country travel where motorized travel would be limited to existing routes. This would reduce opportunities for cross- country travel in the decision area. The 3 percent disturbance cap could restrict the amount of new routes that could be constructed; any routes constructed in excess of the disturbance cap would require mitigation necessary to offset the resulting loss of habitat. Impacts from implementation actions, such as evaluating the need for permanent or seasonal road closures, activity-level travel plans, limiting new route construction, and restoration of routes in PHMA would be analyzed in subsequent NEPA documents.	There would be 12,145,400 acres in PHMA and GHMA previously open to cross-country travel where motorized travel would be limited to existing routes. This would reduce opportunities for cross- country travel in the decision area. Impacts from implementation actions, such as evaluating the need for permanent or seasonal road closures in PHMA/GHMA would be analyzed in subsequent NEPA documents.	There would be 12,145,400 acres in PHMA and GHMA previously open to cross- country travel where motorized travel would be limited to existing routes. This would reduce opportunities for cross- country travel in the decision area. Upgrades to existing routes that would change the route category would be prohibited, and route construction would be limited to realignments of existing routes that minimize impacts on PHMA/GHMA. These actions would result in fewer upgrades to the travel network to accommodate current and future use. Impacts from implementation actions, such as evaluating the need for permanent or seasonal road closures in PHMA/GHMA, would be analyzed in subsequent NEPA documents.	Impacts from Alternative E would be the same as those under Alternative A.	Impacts would be the same as or similar to those under Alternative D, except Alternative F would further restrict the construction of new routes by not allowing new routes within a 4-mile buffer from leks. This would result in fewer new travel opportunities.	Impacts from the Proposed Plan would be the same as or similar to those under Alternative D.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Lands and Realty						
Authorizations Under Alternative A, the BLM and Forest Service would continue to administer ROWs under current management systems, and existing ROWs in the decision area would continue to provide access and utilities for permittees and lease-holders. No acres would be designated as ROW avoidance, while 1,884,300 acres would continue to be designated exclusion. All other lands within the decision area would continue to be open for land use authorization development, thereby allowing the BLM and Forest Service to accommodate future ROW demand. BLM -administered and National Forest System lands would continue to be available for multiple-use and single- use communication sites and road access ROW (or SUAs) on a case-by- case basis pursuant to Title V of FLPMA, and 43 CFR Part 2800 and 2900 regulations (BLM) and 36 CFR § 251 Subpart B (Forest Service). All new linear ROWs, fiber optic cables, transmission lines, pipelines, and communication sites would be encouraged to locate within designated corridors and existing sites. All LUA applications would be reviewed using the criteria of following existing corridors wherever practical and avoiding the proliferation of separate authorizations (e.g., through co-location). Where existing development is not present, co-location requirements can limit options for new development. ***Utility Corridors*** Currently there are 1,322,800 acres of utility corridors within the sub-region.	***Authorizations*** This alternative, which would designate PHMA as ROW exclusion areas and GHMA as avoidance areas while encouraging the BLM and Forest Service to take advantage of opportunities to remove, bury, or modify existing power lines in PHMA, would impose greater limitations on future authorizations compared to Alternative A. In PHMA, there would be limited to no opportunity for new ROW development. Exclusion areas would result in reconfigurations of proposed infrastructure, such as electrical transmission lines and pipelines, so as to avoid Greater Sage-Grouse habitat. While management under Alternative B encourages co-location, often co-location is not feasible. In ROW avoidance areas, RDFs (to be applied consistent with applicable law) and other Greater Sage-Grouse habitat mitigation requirements could increase project costs, lengthen agency review periods, and in some cases result in projects being withdrawn or relocated outside Greater Sage-Grouse habitat. In addition, ROW exclusion and avoidance designations could extend processing time for renewals of existing LUAs and make siting of new linear or site LUAs more difficult than under Alternative A. Exclusion and avoidance designations under Alternative B would also result in impacts on the location and design of communication towers on both BLM-administered and National Forest System lands. In PHMA, new facilities would be excluded	***Authorizations*** This alternative, which would designate all lands within the planning area as ROW exclusion areas, would impose the greatest limitations on future authorizations, including linear ROWs such as transmission lines and pipelines, and site authorizations such as communication facilities. For linear ROWs, this alternative could increase the length of these projects to avoid Greater Sage-Grouse habitat, thus increasing project costs. In some areas, there could be opportunities to co- locate new infrastructure with compatible ROW developments; however, these opportunities would likely be limited in scope and location and incur additional costs compared to Alternative A. ***Utility Corridors*** All utility corridors under Alternative C would be managed as ROW exclusion, thereby eliminating any incentive for placement of ROW infrastructure in those locations. This would impact the utility market by reducing the future service availability to customers. ***Land Tenure*** Requirements under Alternative C for the BLM and Forest Service to retain public ownership in PHMA with no exceptions would preclude opportunities to consolidate land ownership and improve land and resource management efficiency. Under Alternative C, the BLM and Forest Service would recommend all Greater Sage-Grouse habitat, including mineral split-estate, for mineral withdrawal.	***Authorizations*** The designation of PHMA and GHMA as ROW avoidance areas under Alternative D would allow ROW development to occur if development incorporates specific design and mitigation measures and stipulations that would result a net conservation gain of Greater Sage-Grouse habitat. These additional restrictions would impact processing time for the BLM and Forest Service and could increase costs for the applicants. Alternative D would have greater impacts on the lands and realty program than Alternative A. Under Alternative D, ROW authorizations in Greater Sage-Grouse habitat would be required to apply RDFs consistent with applicable law, such as retrofitting with anti- perching devices, to minimize impacts on Greater Sage-Grouse and its habitat. Application of RDFs consistent with applicable law could result in increased development costs and construction timelines. ***Utility Corridors*** New authorizations in designated corridors would be required to incorporate RDFs consistent with applicable law to minimize impacts on Greater Sage-Grouse habitat. This could reduce the incentives for locating development in corridors. ***Land Tenure*** Management actions under Alternative D that prioritize Greater Sage-Grouse habitat for acquisition and limit disposal of these lands would assist the BLM and Forest Service in prioritizing future land tenure and land ownership adjustments. Disposal and/or acquisitions of BLM-administered lands would	***Authorizations*** In California, impacts under this alternative would be the same as Alternative A. In Nevada, specific mitigation measures would be set in place to avoid, minimize, and mitigate impacts on breeding, nesting, brood- rearing, and wintering habitats. Proposed management to conserve Greater Sage-Grouse habitat would result in the modification of proposed ROW actions and/or incorporation of conditions to lessen any adverse effects on Greater Sage-Grouse and its habitat. Under Alternative E, ROW applicants would be required to incorporate Site- Specific Consultation-Based Design Features (see Appendix D [of the 2015 Final EIS]), such as reducing the disturbance footprint, seasonal use limitations, and co- location of structures. These measures could restrict infrastructure development in specific areas and could impact management and maintenance of existing and future development. Under Alternative E, in the State of Nevada only, the application of RDFs consistent with applicable law, such as consolidating ROWs within existing utility corridors and burying power lines, could affect lands and realty by limiting the availability of lands suitable for consolidated development. Requirements to bury transmission lines could result in the added cost of the development prohibiting completion or restricting the scope of the project. ***Utility Corridors*** For lands in California, impacts on utility corridors would be the same as Alternative A. For lands in Nevada, encouraging the use of	***Authorizations*** Impacts on land use authorizations under Alternative F would be similar to Alternative C, with the exception that new ROWs would be allowed if co-located with existing ROWs, particularly those within designated utility corridors. Although no areas in Greater Sage-Grouse habitat would be open to new ROW development, demand for new ROWs could be accommodated if co-located with existing ROWs. Restricting all new authorizations to co- location would minimize opportunities for new development compared to Alternative A and likely increase the complexity and costs of proposed ROWs in Greater Sage-Grouse habitat. Because existing infrastructure is limited to select locations in the planning area, other areas without existing ROWs would be excluded from future ROW development. The BLM and Forest Service would only authorize new communication infrastructure where it could be co-located in an existing site. When enhancements are needed, restrictions on new communication site leases would prevent the optimal transmittal of communication signals throughout the network. ***Utility Corridors*** Alternative F, which identifies corridors with existing ROW infrastructure as the desired location for future ROW development, would limit new ROWs to 1,322,800 acres (8 percent of the planning area). Limiting the amount of lands available to new ROW development to only 8 percent of the planning area would preclude	***Authorizations*** The Proposed Plan, which distinguishes between major and minor ROWs, would designate PHMA as ROW avoidance areas for major and minor ROWs. GHMA would be open to minor ROWs, while major ROWs would be avoided. In PHMA, new authorizations would be required to meet Greater Sage-Grouse screening criteria, which require the project to demonstrate a net conservation gain to Greater Sage-Grouse and its habitat, incorporate specific conditions, apply mitigation measures, noise stipulations, and RDFs, abide by lek buffer distances, and meet tall structure requirements. Proposed ROWs within GHMA would also be required to follow Greater Sage-Grouse screening criteria, including achievement of net conservation gain for Greater Sage-Grouse, RDFs, noise limitations, and seasonal buffers. Collectively, these screening criteria would impact BLM and Forest Service processing times and increase costs for the applicants. In some cases, this could restrict smaller ROW applicants from receiving a ROW due to financial feasibility. The Proposed Plan would exempt the Trans West Express transmission line from the requirements of this plan. Allowing the Trans West Express transmission line would enable the BLM and Forest Service to accommodate a portion of the future bulk transmission demand in the planning area. The previously authorized South West Intertie line would accommodate additional demand

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There would be no new corridors designated. Widths in existing corridors vary from 0.5 mile up to 3 miles wide. These corridors would continue to be the preferred location for new ROW development. ***Land Tenure*** Under Alternative A, approximately 766,300 acres of BLM lands (within PHMA and GHMA) would continue to be available for disposal. Land disposal, which must meet the criteria under FLPMA Section 203 and applicable LUPs, would improve BLM lands and realty program and overall BLM management efficiency. The Forest Service has not identified specific lands for exchange or disposal.	and only modifications to the existing communication tower network (e.g., expansion of existing facilities) in PHMA would be allowed. In GHMA, conditions on tower design (e.g., tower height) may prevent the effective transmittal of communication signals to adjacent towers. ***Utility Corridors*** Actions towards corridors under Alternative B would reduce the available lands open to entry for linear ROWs and could cause new linear ROWs to concentrate uses in existing corridors, causing existing designated corridors within Greater Sage-Grouse habitat to become full and subsequently unavailable for additional linear ROWs. This could impact the utility market by potentially reducing the service availability to customers. ***Land Tenure*** Alternative B, which would result in PHMA being retained in public ownership except where a more contiguous federal ownership pattern or more effective management of Greater Sage-Grouse habitat would result from the land tenure action, would limit land tenure actions compared to Alternative A. Recommending the withdrawal of 9,342,600 additional acres for locatable mineral entry in PHMA would decrease future demand for ROWs in those areas.	Eliminating locatable mineral development in Greater Sage-Grouse habitat would eliminate any demand for ancillary land use authorizations to support mineral development.	allow for more contiguous federal ownership patterns within the Greater Sage-Grouse habitat area, or where a land tenure adjustment would result in a net gain in the amount or quality of Greater Sage-Grouse habitat.	existing corridors for new ROW development could result in corridors eventually becoming overcrowded with ROWs and unfeasible for additional development, which could result in costly retrofitting of existing infrastructure to increase capacity or redirect new development to areas within or outside of Greater Sage-Grouse habitat. This could impact the utility market by potentially reducing the service availability to customers. ***Land Tenure*** Impacts on land tenure would be the same as Alternative A.	additional development in the remaining 92 percent. Concentrating new development in existing corridors could also preclude long-term development in those locations as corridors become overcrowded. The result could be costly retrofitting of existing infrastructure in the corridors to increase capacity. New development could also be redirected to areas outside of Greater Sage-Grouse habitat, thereby impacting the utility market by potentially reducing the service availability or increasing costs for customers. ***Land Tenure*** Impacts from land tenure and land ownership adjustments would be the same as Alternative B.	for north-south electricity transmission. Under the Proposed Plan, all new ROW development in PHMA, except the Trans West Express project, would contribute toward a 3 percent anthropogenic disturbance cap. Exceedance of the cap in any BSU would prohibit any future ground-disturbing authorizations in those areas. Impacts in BSUs where the cap exceeds 3 percent would be the same as Alternative C. ***Utility Corridors*** Under the Proposed Plan, existing utility corridors would be open for new ROWs in Greater Sage-Grouse habitat; however, 1,097,800 acres of existing utility corridors would be undesignated, and the width of the remaining 225,000 acres of designated corridors would be set at a maximum width of 3,500 feet. These actions towards corridors would reduce the available lands open to entry for linear ROWs and could cause new linear ROWs to concentrate in existing corridors. Over time, corridors could become overcrowded and unfeasible for additional ROW development. Costly retrofitting of existing infrastructure or redirecting new development to areas outside of Greater Sage-Grouse habitat could increase capacity. These added costs would negatively impact the utility market by potentially reducing the availability of affordable service to customers. ***Land Tenure*** Management under the Proposed Plan that prioritizes Greater Sage-Grouse habitat for acquisition and limits disposal would assist the BLM and Forest Service in prioritizing future land tenure and land ownership adjustments. By

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
						allowing land tenure actions that result in the net conservation gain of Greater Sage-Grouse habitat, the BLM and Forest Service could carry out actions that consolidate land ownership or acquire lands with higher- quality Greater Sage-Grouse habitat. Recommending the withdrawal of SFAs (2,797,400 additional acres compared to Alternative A) for locatable mineral entry would decrease the short- and long-term demand for ROWs to support mineral development.
Renewable Energy						
Within existing PHMA/GHMA 1,884,200 acres of lands would be affected by wind ROW/SUA exclusion areas and 15,896,500 acres of lands would be affected by solar ROW exclusion or avoidance areas. All other lands with renewable energy potential would continue to be open for ROW and SUA applications on a case-by-case basis. Continuation of current management would have direct impacts on the ROW program by allowing new facilities to be constructed and continuing the demand for ROWs (e.g., transmission lines) to service renewable energy projects.	Under Alternative B, the management of PHMA (10,120,700 acres) as ROW/SUA exclusion areas and GHMA (6,405,900 acres) as wind ROW avoidance areas would eliminate or restrict wind energy development in Greater Sage-Grouse habitat. Management of areas as ROW exclusion would force development to occur outside PHMA and/or on private lands. Within avoidance areas, mitigation requirements (e.g., RDFs consistent with applicable law) could increase project costs, lengthen review periods, and create more complex projects. Requirements for siting projects in avoidance areas could also redirect wind energy development from federal to non-federal lands. Direct short- and long-term impacts on solar energy ROWs would be the same as Alternative A. Indirect impacts from restrictions on other ROWs (e.g., transmission lines) in Greater Sage-Grouse habitat could further restrict solar and wind ROW opportunities even where those ROWs are not excluded.	Under Alternative C, Greater Sage-Grouse habitat (16,526,600 acres) would be excluded from wind and solar ROW applications. While the exclusion area would eliminate development potential in PHMA, the areas most affected would be those areas of moderate to high potential for wind energy development, which are confined largely to mountain ridge tops. Excluding wind energy ROWs in Greater Sage-Grouse habitat would force development to occur on federal lands outside habitat and/or on private lands. Excluding other ROWs, such as transmission lines, would indirectly affect renewable energy development potential outside PHMA if that infrastructure is needed across Greater Sage-Grouse habitat to support renewable energy development on adjacent non-habitat lands. Determining lands of non- habitat would allow the BLM to be more transparent regarding lands that would have fewer restrictions for future development. Renewable energy companies would be able to identify what lands are available and open to development.	Direct short- and long-term impacts under Alternative D would be the same as Alternative C. Because Alternative D would have slightly fewer restrictions on other ROW types (e.g., transmission lines), the indirect effects on renewable energy development under Alternative D would be less in unmapped areas outside PHMA and GHMA.	In California, impacts under Alternative E would be the same as Alternative A. In Nevada, the BLM and Forest Service would avoid core, priority, and general habitat wherever possible and would only allow ROW development within these areas to occur if SETT consultation was completed and the appropriate mitigation measures were applied (e.g., through RDFs consistent with applicable law and the conservation credit system). These increased measures would restrict renewable energy development in specific areas and would impact management and maintenance of existing and future development. Limitations on new ROWs and above- ground linear features such as transmission lines would limit the BLM's and Forest Service's ability to accommodate demand for renewable energy ROW development, which in turn could restrict the availability of energy or service availability and reliability for communication systems.	Impacts on wind and solar energy ROWs within Greater Sage-Grouse habitat would be the same as Alternative C. Alternative F would also prohibit wind energy development within five miles of active leks, which could result in a larger area where wind and solar ROWs are excluded.	Under the Proposed Plan, the BLM and Forest Service would manage PHMA (10,296,100 acres) as ROW exclusion for utility-scale commercial wind and solar. GHMA (6,516,700 acres) would be managed as ROW avoidance for wind and exclusion for solar ROWs. Impacts on wind energy ROWs in PHMA and solar ROWs in PHMA and GHMA would be the same as Alternative D. Although new wind ROWs could be developed in GHMA, the BLM and Forest Service would only allow ROW development within avoidance areas to occur if the development meets the Greater Sage-Grouse screening criteria (Action SSS 1) and incorporates appropriate RDFs consistent with applicable law in design and construction (e.g., noise, tall structure, or seasonal restrictions). Facilities would have to be sited and developed in non-habitat or mitigated so that there is a net conservation gain to Greater Sage-Grouse and its habitat. Added restrictions in GHMA would increase project costs, design complexity, and agency review times compared to Alternative A The requirement to apply RDFs consistent with applicable law in

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
						OHMA could increase project costs and agency review times for projects in those areas. Limitations on other types of new ROWs (e.g., transmission lines) under the Proposed Plan could indirectly limit the BLM's and Forest Service's ability to accommodate demand for renewable energy ROW development in GHMA and OHMA.
Minerals – Fluid						
This alternative is the least restrictive and would continue to allow fluid mineral development to continue on 14,642,300 acres with standard stipulations. It is projected that 100 new exploratory and development wells would be drilled during the life of the LUP. Of these new wells, 41 are expected to be producing oil and gas (see Appendix P [of the 2015 Final EIS]).	Overall, as a result of increased restrictions and limitations as compared to Alternative A, Alternative B would result in an increase in the magnitude and duration of effects on fluid minerals development over time with the closure of 61 percent (10,120,700 acres) of the decision area. Geophysical exploration would be permitted within PHMA areas with restrictions. These restrictions would likely reduce the amount of geophysical exploration within the decision area, which could reduce the amount of fluid mineral resources that are identified and developed.	The Forest Service and BLM would develop strategies to terminate existing leases and close the entire decision area to fluid mineral leasing. This would reduce the amount of fluid mineral resource exploration and development on existing leases within the decision area. No lands within the decision area would be available for new ROWs. Because federally managed lands are closed to leasing under this alternative, there would be no impacts on public lands. However, Alternative C could also decrease development of fluid mineral projects on private lands by decreasing the accessibility and availability to develop infrastructure (e.g., pipelines and transmission lines) on public lands.	All federal fluid minerals in PHMA and GHMA would be open to fluid mineral leasing subject to an NSO stipulation that provides no exception, modification, or waiver language. Geophysical exploration would be permitted within GHMA and PHMA areas; however, PHMA would be subject to restrictions. These restrictions would likely reduce the amount of geophysical exploration within the decision area, which could reduce the amount of fluid mineral resources that are identified and developed. Limitations on new ROWs and aboveground linear features, such as transmission lines, would limit the BLM's ability to accommodate demand for fluid mineral ROW development, which in turn could restrict the availability of fluid minerals.	Under Alternative E, all Greater Sage-Grouse habitat would be managed under moderate stipulations (TL and CSU) and would apply the avoid, minimize, and mitigate strategy as described in the state plan. These management requirements could increase cost and time to develop the resource compared to Alternative A.	Impacts would be the same as or similar to those under Alternative C. Overall, as a result of increased restrictions and limitations as compared to Alternative A, Alternative F would result in an increase in the magnitude and duration of effects on fluid minerals development over time with the closures of 100 percent of the decision area.	This alternative would require a 3 percent disturbance cap on anthropogenic surface-disturbing activities in PHMA and impose RDFs consistent with applicable law and a net conservation gain in both PHMA and GHMA. PHMA would be managed as NSO, and GHMA would be managed with CSU/TL restrictions. In PHMA and GHMA, geophysical exploration that does not result in crushing of sagebrush vegetation or does not create new or additional surface disturbance would be permitted.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Minerals – Locatable						
This alternative would be the least restrictive to locatable minerals because a larger percentage of the decision area (97 percent) would continue to be open to locatable mineral entry, and no additional restrictions would be applied to mining operations.	Total withdrawals (including lands currently withdrawn) under this alternative would increase to 57 percent (9,342,600 acres) of the decision area in comparison with Alternative A, thereby further limiting opportunities for locatable mineral development in the decision area.	Total withdrawals, including lands currently withdrawn, under this alternative would increase to 100 percent of the decision area in comparison with Alternative A, thereby, further limiting opportunities for locatable mineral development in the decision area.	This alternative would have the same percentage of the decision area open to locatable mineral entry as Alternative A. Additional restrictions and design features for locatable minerals would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of locatable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential locatable mineral development economically infeasible.	Under Alternative E, the acres of federal mineral estate closed to mineral entry would be the same as Alternative A. However, the Nevada Conservation Credit System would be implemented, and additional restrictions would apply within areas of Greater Sage-Grouse habitat. Noise, structure height, and timing limitations would also apply, and mitigation may be required. Additional restrictions and design features for locatable minerals would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of locatable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential locatable mineral development economically infeasible.	Impacts would be the same as under Alternative B.	The total area recommended for withdrawals or currently withdrawn under this alternative would increase to 20 percent (3,596,200 acres) of the decision area in comparison with Alternative A, thereby further limiting opportunities for locatable mineral development in the decision area in the event that withdrawals occur on areas that are recommended for withdrawal. This alternative would have a lesser impact than Alternatives B, C, or F since there are fewer acres and no active mines within the area recommended for withdrawal. Subject to valid existing rights and applicable law, additional restrictions and design features for locatable minerals would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of locatable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential locatable mineral development economically infeasible.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Minerals – Salable						
Approximately 11 percent (1,884,300 acres) of federal mineral estate within existing habitat would continue to be closed to mineral material disposal. Road construction would likely decrease on BLM-administered and National Forest System surface in the decision area that would continue to be managed as ROW avoidance or exclusion under this alternative, which would result in a decrease in demand for mineral materials in those areas. Impacts from this decrease in demand would be mitigated where new ROWs could be co-located within existing ROWs to satisfy valid existing rights.	Approximately 61 percent (10,120,700 acres) of federal mineral estate within existing habitat would be closed to mineral material disposal. These closures would decrease access for local governments and members of the public to mineral material sites. Road construction would likely decrease on BLM- administered and National Forest System surface in the decision area that would be managed as ROW avoidance or exclusion under this alternative, which would result in a decrease in demand for mineral materials in those areas. Impacts from this decrease in demand would be mitigated where new ROWs could be co- located within existing ROWs to satisfy valid existing rights.	100 percent of federal mineral estate in existing habitat would be closed to mineral material disposal. These closures would decrease access for local governments and members of the public to mineral material sites. Road construction would likely decrease on BLM- administered and National Forest System surface in the decision area that would be managed as ROW avoidance or exclusion under this alternative, which would result in a decrease in demand for mineral materials in those areas. Impacts from this decrease in demand would be mitigated where new ROWs could be co- located within existing ROWs to satisfy valid existing rights.	16,526,600 acres of federal mineral estate in existing habitat would be closed to mineral material disposal. These closures would decrease access for local governments and members of the public to mineral material sites. Additional restrictions and design features for salable minerals development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of salable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential salable mineral development economically infeasible.	Under Alternative E, the acres of federal mineral estate closed to disposal would be similar to but greater than under Alternative A. However, the Nevada Conservation Credit System would be implemented, and additional restrictions would apply, within areas of Greater Sage-Grouse habitat. Noise, structure height, and timing limitations would also apply, and mitigation may be required. This may result in in decreased access for local governments and members of the public to mineral material sites and/or increase costs of mineral material development. Additional restrictions and design features for salable minerals development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of salable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential salable mineral development economically infeasible.	Impacts would be the same as under Alternative B.	Approximately 72 percent (16,812,800 acres) of federal mineral estate in existing habitat would be closed to mineral material disposal. These closures would decrease access for local governments and members of the public to mineral material sites. Additional restrictions and design features for salable minerals development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of salable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential salable mineral development economically infeasible.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Minerals – Non-energy Leasable						
Approximately 11 percent (1,884,300 acres) of federal mineral estate within existing habitat would continue to be closed to nonenergy leasable mineral development.	Approximately 61 percent (10,120,700 acres) of federal mineral estate within existing habitat would be closed to nonenergy leasable mineral development.	100 percent of federal mineral estate in existing habitat would be closed to non-energy leasable mineral development.	16,526,600 acres of federal mineral estate in existing habitat would be closed to nonenergy leasable mineral development. Additional restrictions and design features for nonenergy leasable mineral development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of nonenergy leasable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential nonenergy leasable mineral development economically infeasible.	Under Alternative E, the acres of federal mineral estate closed to nonenergy leasable mineral development would be similar to Alternative A. However, the Nevada Conservation Credit System would be implemented and additional restrictions would apply within areas of Greater Sage-Grouse habitat. Noise, structure height, and timing limitations would also apply, and mitigation may be required. Additional restrictions and design features for nonenergy leasable mineral development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of nonenergy leasable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential nonenergy leasable mineral development economically infeasible.	Impacts would be the same as under Alternative B.	Approximately 72 percent (16,812,800 acres) of federal mineral estate in existing habitat would be closed to nonenergy leasable mineral development. Additional restrictions and design features for nonenergy leasable mineral development would apply in Greater Sage-Grouse habitat. This could result in (1) reduced availability of nonenergy leasable mineral resources, (2) reduced access to new or existing mines due to restrictions on use of the overlying surface lands, and (3) reduced efficiency and increased operational costs that make potential nonenergy leasable mineral development economically infeasible.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Lands with Wilderness Characteristics						
This alternative would have the most impact to lands with wilderness characteristics because there are currently few restrictions on anthropogenic activities. Most lands, outside of designated wilderness, wilderness study areas, and lands managed by the Northern California District, remain open to cross-country travel, open to mineral development, and open to ROW development, with exception solar exclusion. Continued development would compromise the wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values on lands with wilderness characteristics.	This alternative would primarily protect lands with wilderness characteristics where they overlap with PHMA. Wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values would be protected in PHMA would be through limiting OHV travel to existing roads and trails, excluding ROW, and closing mineral development including recommending for locatable mineral withdrawal. GHMA would be afforded fewer restrictions except for imposing a ROW avoidance restriction, therefore wilderness characteristics of naturalness, opportunity for solitude and primitive recreation values could be compromised where they intersect with GHMA.	This alternative is the most restrictive for all of PHMA and GHMA in that all habitat would be managed as PHMA with exclusion for ROWs, closure to all mineral leasing and development, closure to livestock grazing, and all habitat would be recommended for withdrawal. In addition all lands would be limited to existing roads and trails for OHV use. Where lands with wilderness characteristics intersect with PHMA and GHMA, the wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values would be preserved because anthropogenic disturbances would be virtually eliminated.	This alternative restricts OHV travel to existing roads and trails in PHMA and GHMA, closes non-energy and salable minerals in all habitat, allows for fluid mineral leasing only under an NSO stipulation, and manages ROWs as either avoidance or exclusion areas. These management actions would help to retain the wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values associated with lands with wilderness characteristics where they intersect with Greater Sage-Grouse habitat. There would be no recommended withdrawal for locatable minerals, so mining activity would continue and could impact the wilderness characteristic values where they intersect with Greater Sage-Grouse habitat.	This alternative restricts OHV travel to existing roads and trails, but has no allocation restrictions. All anthropogenic activities would be allowed subject to the State of Nevada's Conservation Credit System which imposes stringent mitigation measures. Similar to Alternative A, activities allowed under this alternative could impact wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values where they intersect with Greater Sage-Grouse habitat.	This alternative has very restrictive management actions similar to Alternative C for PHMA, but is less restrictive in GHMA. Where lands with wilderness characteristics intersect with PHMA, the naturalness would be preserved because anthropogenic disturbances would be virtually eliminated. GHMA remains open to salable mineral development and non- energy mineral development, and is not recommended for withdrawal. These activities could impact wilderness characteristics of naturalness, opportunity for solitude, and primitive recreation values where they intersect with GHMA.	This alternative would primarily protect lands with wilderness characteristics where they overlap with PHMA. Protections of natural values in PHMA would be through limiting OHV travel to existing roads and trails, closing lands to salable and non-energy leasable mineral development, allowing for fluid mineral leasing under a strict NSO stipulation, recommending for locatable mineral withdrawal within the SFA, and imposing ROW avoidance and exclusion management actions. In addition, a 3% disturbance cap protocol would be applied as well as other restrictive screening criteria. These management actions would help to retain the naturalness, opportunities for solitude, and primitive recreation values associated with lands with wilderness characteristics where they intersect with Greater Sage-Grouse habitat. GHMA would be afforded fewer restrictions and the naturalness, opportunities for solitude, and primitive recreation values of lands with wilderness characteristics could be compromised where they intersect with GHMA.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Areas of Critical Environmental Concern						
Management decisions for the 29 existing ACECs containing Greater Sage-Grouse habitat in the planning area would continue to provide supplemental support for the protection of existing ACEC relevance and importance values and Greater Sage-Grouse habitat within the boundaries of the existing ACECs.	Under Alternative B, approximately 115,300 acres in 22 existing ACECs will be subject to additional management protections from Greater Sage-Grouse management prescriptions. Between existing ACEC management and proposed Greater Sage-Grouse management the more restrictive management prescription will take precedence.	Under Alternative C management prescriptions for approximately 9,458,000 acres (PHMA) in 18 proposed ACECs would provide specific protection and management efforts for Greater Sage-Grouse compared with Alternative A. Management decisions for Greater Sage-Grouse may benefit and compliment management decisions protecting relevance and importance values on 115,300 acres in 22 existing ACECs. Between existing ACEC management and proposed Greater Sage-Grouse ACEC management, the more restrictive management prescription will take precedence.	Under Alternative D, impacts would be similar to those in Alternative A because management prescriptions in the majority of existing ACECS are the same or more restrictive than proposed Greater Sage-Grouse management. Between existing ACEC management and proposed Greater Sage-Grouse management, the more restrictive management prescription will take precedence.	Under Alternative E, impacts would be similar to those in Alternative D because total acreage and number of existing ACECs affected and other Greater Sage-Grouse habitat is the same. However, because proposed management prescriptions under this alternative would be less restrictive than Alternative D, effects on existing ACECs would be minimal. Between existing ACEC management and proposed Greater Sage-Grouse management, the more restrictive management prescription will take precedence.	Under Alternative F, management prescriptions for approximately 878,700 acres (PHMA) in 9 proposed ACECs would provide specific protection and management efforts for Greater Sage-Grouse compared with Alternative A. As with Alternative B and Alternative C, 22 existing ACECs would be beneficially impacted by more restrictive management prescriptions. Between existing ACEC management and proposed Greater Sage-Grouse ACEC management, the more restrictive management prescription will take precedence.	Under the Proposed Plan, impacts would be similar to Alternatives A, B, D, and E in that no proposed ACECs would be designated. Like Alternative D, the management prescriptions of existing ACECs is the same or more restrictive than proposed Greater Sage-Grouse management prescriptions. However, those ACECs that contain SFAs will benefit from the fluid mineral NSO with no exception, modification, or waiver stipulation and the recommended mineral withdrawal in the event that the areas are withdrawn. Between existing ACEC management and proposed Greater Sage-Grouse management, the more restrictive management prescription will take precedence.
Water Resources						
Under Alternative A, there are currently areas designated as PHMA and GHMA. However, the LUPs do not contain any special designations pertaining to managing Greater Sage-Grouse, and there are no consistent goals or objectives for management of Greater Sage-Grouse habitat within the LUPs. The impacts from Greater Sage-Grouse management would continue to be the same as those resulting from current management identified in existing LUP documents, land health standards, and applicable agency policy or guidance. Management of projects and activities within habitat would be done on a case-by-case basis.	Alternative B generally reduces land disturbances and would result in fewer impacts on water resources associated with a particular use compared with Alternative A. Alternative B does identify goals and objectives for enhancing and protecting Greater Sage-Grouse habitat, particularly from anthropogenic disturbances. Protecting Greater Sage-Grouse habitat would result in few land disturbances and could result in reduced impacts on water quality. Protection measures may also include protecting existing water sources from future use and result in increases to water availability.	Management under Alternative C would reduce land disturbances and would result in fewer impacts on water resources associated with a particular use compared with Alternative A. This alternative identifies more exclusion areas for ROWs, closes more areas to leasable and salable minerals, withdraws more areas for locatables and makes more areas unavailable to grazing. It also recommends more passive restoration. Reduction of surface disturbance activities through either exclusion or avoidance would reduce potential for soil erosion, thereby reducing impacts on water quality and reducing the need for water for project use, reducing impacts on water quantity.	Management under Alternative D would reduce land disturbances and would result in fewer impacts on water resources associated with a particular use compared with Alternative A. RDFs identified for Alternative D, including removing water developments that are negatively impacting habitat, removing or modifying developments that are negatively impacting riparian habitat, and requiring vegetation reclamation from ground-disturbing activities, would all reduce impacts on water resources. Reduction of surface- disturbing activities through either exclusion or avoidance would reduce potential for soil erosion, thereby reducing impacts on water quality and reducing the need for water for project use, reducing impacts on water quantity. Management under Alternative D, for leasable minerals, would list	Alternative E identifies Greater Sage-Grouse management areas and discusses collaboration through the ecosystem council, monitoring of habitat, predation controls, a mitigation banking program, mitigation of habitat, and a requirement of net conservation gain. Mitigation of habitat, specifically restoration or creation of habitat, could reduce impacts on water resources, but the result would be dependent on the actions occurring and location of the work.	Alternative F generally constrains resource use and would decrease any impacts on water resources associated with a particular use compared with Alternative A. Under this alternative, there would be a 3 percent cap on disturbance within Greater Sage-Grouse habitat. Once the cap is met, no new activities that would result in land disturbance would be authorized. Reduction of surface- disturbing activities through either exclusion or avoidance would reduce potential for impacts to water resources.	The Proposed Plan combines aspects of Alternative D and the revised Alternative E and would result in fewer impacts on water resources associated with a particular use compared with Alternative A. Of the acres designated as PHMA, some acres are identified as SFAs, which will be managed as PHMA, recommended for withdrawal from the mining act, managed as NSO for mineral leasing and prioritized for management and conservation activities. OHMA is unmapped habitat that is potentially suitable. Protecting Greater Sage-Grouse habitat would result in few land disturbances and could result in reduced impacts to water resources.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
			stipulations for NSO in PHMA and GHMA for currently unleased areas and require site-specific conservation measures for reducing land disturbance on leased areas. In OHMA, nonenergy leasables would be managed as open, and oil and gas and geothermal resources would be managed as open subject to standard stipulations. Although NSO stipulations may result in decreases in surface water impacts by reducing erosion potential and on-site spills, it would not necessarily result in a decrease in groundwater impacts. Potential impacts of drilling and extracting of fluid resources on groundwater aquifers would remain the same. RDFs associated with reducing surface disturbance, vegetation reclamation, and stream crossings would all reduce erosion potential, thereby reducing impacts on water resources.			

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Tribal Interests						
This alternative could lead to decreased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior if the nonestablishment of PHMA/GHMA acres leads to future decreases in Greater Sage-Grouse populations. This alternative is expected to maintain tribal access to pine nutting areas and observing lekking behavior because future access to these areas would likely be maintained at current levels. Comprehensive travel and transportation management would maintain current tribal access to important pine nutting areas and juniper trees used to maintain traditional tribal cultural practices and values.	Greater Sage-Grouse management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. Because this alternative proposes ROW avoidance in PHMA and/or GHMA, this could result in decreased opportunities for tribes to maintain traditional practices through restrictions imposed on access to pine nutting areas and observing lekking behavior. However, exceptions to tribes to access current areas used for traditional practices could be granted in future site-specific NEPA analyses. While this alternative would limit motorized travel to existing roads within PHMA, current tribal access to important pine nutting areas and juniper trees used to maintain traditional tribal cultural practices and values would be maintained.	Greater Sage-Grouse management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. Because this alternative proposes ROW avoidance in PHMA and/or GHMA habitat, this could result in decreased opportunities for tribes to maintain traditional practices through restrictions imposed on access to pine nutting areas and observing lekking behavior. However, exceptions to tribes to access current areas used for traditional practices could be granted in future site-specific NEPA analyses. This alternative would limit motorized travel to existing roads within PHMA; however, current tribal access to important pine nutting areas and juniper trees used to maintain traditional tribal cultural practices and values would likely be maintained.	Greater Sage-Grouse management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. Because this alternative proposes ROW avoidance in PHMA and/or GHMA habitat, this could result in decreased opportunities for tribes to maintain traditional practices through restrictions imposed on access to pine nutting areas and observing lekking behavior. However, exceptions to tribes to access current areas used for traditional practices could be granted in future site-specific NEPA analyses. Impacts from travel and transportation would be the same as under Alternative C.	Greater Sage-Grouse management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. This alternative is expected to maintain tribal access to pine nutting areas and observing lekking behavior because future access to these areas would likely be maintained at current levels. Impacts from travel and transportation would be the same as under Alternative D.	Greater Sage-Grouse management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. Because this alternative proposes ROW avoidance in PHMA and/or GHMA habitat, this could result in decreased opportunities for tribes to maintain traditional practices through restrictions imposed on access to pine nutting areas and observing lekking behavior. However, exceptions to tribes to access current areas used for traditional practices could be granted in future site-specific NEPA analyses. Impacts from travel and transportation would be the same as under Alternative B.	Management under the Proposed Plan would establish collaborative management goals and objectives within PHMA/GHMA that could stabilize or increase Greater Sage-Grouse populations in the future. If successful, these management goals and objectives could lead to increased opportunities for tribes to maintain traditional cultural practices and values such as observing lekking behavior. This alternative would manage permitted livestock grazing to maintain PHMA and GHMA in order to help meet all life-cycle requirements of Greater Sage-Grouse. This could increase tribal opportunities to observe Greater Sage-Grouse behavior if this strategy leads to stabilization or increases in Greater Sage-Grouse populations. However, this alternative could reduce tribal economic benefits if their current AUMs are reduced in the future in order to meet these management goals. The Proposed Plan would manage and minimize effects of land use actions on PHMA and GHMA but would allow for corridors and ROWs that result in a net conservation gain of habitat. Tribes would be able to maintain traditional practices by accessing pine nutting areas and observing lekking behavior. Restricting new development and land use authorizations near leks would likely maintain traditional tribal cultural practices and values.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Climate Change						
The impacts from Greater Sage-Grouse management would continue to be the same as those resulting from current management identified in existing LUP documents, land health standards, and applicable agency policy or guidance. Management of projects and activities within habitat would be done on a on climate change would be negligible at the landscape scale; however, there may be more noticeable impacts at the project-site level depending on project-specific activities and mitigation actions.	The NTT report did not address climate change, therefore impacts are the same as under Alternative A.	Alternative C generally constrains resource use and would decrease any GHG emissions associated with a particular use compared with Alternative A. This alternative identifies more exclusion areas for ROWs, closes more areas to leasable and salable minerals, withdraws more areas for locatables, and makes more areas unavailable to grazing. It also recommends more passive restoration, which may or may not help with climate change resiliency.	Alternative D generally constrains resource use and would decrease any GHG emissions associated with a particular use compared with Alternative A.	Alternative E identifies Greater Sage-Grouse management areas and discusses collaboration through the ecosystem council, monitoring of habitat, predation controls, a mitigation banking program, mitigation of habitat, and a requirement of net conservation gain. Mitigation of habitat, specifically restoration or creation of habitat, could reduce impacts on climate change, but the result would be dependent on the actions occurring and location of the work.	Alternative F generally constrains resource use and would decrease any GHG emissions associated with a particular use compared with Alternative A. Under this alternative, there would be a 3 percent cap on disturbance within Greater Sage-Grouse habitat. Once the cap is met, no new activities that would result in land disturbance would be authorized. Reduction of surface- disturbing activities through either exclusion or avoidance would reduce potential for GHG emissions as well as reduced surface disturbances, allowing for management areas to be more resilient to climate change.	Management under the Proposed Plan would constrain resource use and would decrease any GHG emissions associated with a particular use compared with Alternative A. Of the acres designated as PHMA, some acres are identified as SFAs, which will be managed as PHMA, recommended for withdrawal from the mining act, managed as NSO for mineral leasing and prioritized for management and conservation activities. OHMA is unmapped habitat that is potentially suitable for Greater Sage-Grouse. Protecting Greater Sage-Grouse habitat would result in few land disturbances and could result in reduced GHG emissions.

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F	Proposed Plan
Socioeconomic and Environmental Justice						
Under Alternative A, existing opportunities for grazing, recreation, mineral development, lands and realty (including renewable energy development), and travel would not be affected. There would be no change in annual output, annual jobs, or annual earnings. There would be no changes in the distribution of impacts among communities and groups of interest from management of BLM-administered and National Forest System lands when compared to current management. No disproportionately high and adverse impacts on minority or low- income populations would be expected from changes in management.	Under Alternative B, restrictions to oil and gas, geothermal, and wind energy development opportunities would result in reduced growth in output, employment, and earnings compared to Alternative A. Alternative B would also impose limitations and added costs to future economic investments through restrictions to ROW development, including new roadways, and to travel compared with Alternative A. Economic activity attributable to grazing on federal lands with Greater Sage-Grouse habitat is likely to be broadly similar to Alternative A. Although lands unconditionally open to grazing would be the same as under Alternative A, there would likely be some reduction in economic activity due to grazing on federal lands within Greater Sage-Grouse habitat, but to what extent is unknown. The economic effect from recreational activity is not possible to quantify, but if there is a difference versus Alternative A, it is likely to be small. Reductions in economic activity from locatable and salable minerals would be expected but are also not possible to quantify. Compared to Alternative A, Alternative B would tend to favor conservation interest and have adverse effects on development interests. No disproportionately high and adverse impacts on minority or low-income populations would be expected from changes in management.	Adverse impacts on output, employment, and earnings would be greater in Alternative C than any other alternative. Alternative C would impose the most limitations and added costs to future economic investments through ROW and travel restrictions. Livestock grazing on federal lands would be restricted to those allotments with no Greater Sage-Grouse habitat, which would account for about 80 percent of the output, employment, and earnings reductions under Alternative C when compared to Alternative A. The economic effect from recreational activity would be the same as Alternative A. Reductions in economic activity from salable minerals would be the same as under Alternative B, and reductions from locatable minerals would be potentially greater than under Alternative B, but these are not possible to quantify. Alternative C would carry the greatest potential of impacts to specific communities, would favor conservation interests and would have adverse effects on grazing interests. Disproportionately high and adverse impacts on low-income populations would be expected related to employment/earnings impacts from ranching and grazing in Lassen and White Pine Counties and northern portions of Nye County.	Under Alternative D, growth in output, employment, and earnings would be expected to be slightly lower than under Alternative B. ROW development and travel under Alternative D would also face restrictions, but these would be more limited than under Alternatives B and C, except for wind and solar development. Economic activity due to grazing on federal lands within Greater Sage-Grouse habitat would be similar to Alternative B. The economic effect from recreational activity would be similar to Alternative B, and locatable minerals would be similar to Alternative A. Reductions in economic activity from salable minerals would be the same as under Alternatives B and C. Like Alternative B, Alternative D would tend to favor conservation interests and have adverse effect on development interests. No disproportionately high and adverse impacts on minority or low-income populations would be expected from changes in management.	Growth in output, employment, and earnings under Alternative E would be expected to be slightly lower than under Alternative A but higher than all other alternatives. Note that restrictions in Alternative E would affect Nevada only. Limitations and added costs to future economic investments through restrictions to ROW development and travel would be slightly more than under Alternative A and less than all other alternatives. Economic activity due to grazing on federal lands within Greater Sage-Grouse habitat would be similar to Alternatives B and D. The economic effect from recreational activity, locatable minerals, and salable minerals would be the similar to Alternative A. Alternative E would benefit energy and mineral interests the most. No disproportionately high and adverse impacts on minority or low- income populations would be expected from changes in management.	Under Alternative F, growth in output, employment, and earnings would be expected to be the second lowest, higher only than under Alternative C. Restrictions to ROW development and travel would add costs and limit future economic investments similar to Alternative C. Alternative F would impose the most limitations and added costs to future economic investments through ROW and travel restrictions Alternative F would also reduce economic activity due to grazing on federal lands because of the action to rest a portion of PHMA and GHMA each year and limit utilization levels. The economic effect from recreational activity, locatable minerals, and salable minerals would be similar to Alternatives B. Alternative F would carry the second greatest potential of impacts to specific communities after Alternative C, would favor conservation interests, and would have adverse effects on grazing interests. Disproportionately high and adverse impacts on low- income populations would be expected related to employment/earnings impacts from ranching and grazing in Lassen and White Pine Counties and northern portions of Nye County.	Growth in output, employment and earnings is expected as a result of the Proposed Plan, which would be lower than Alternatives A and E, and slightly lower than Alternatives B and D, but higher than Alternatives F and C. Limitations and added costs to future economic investments through restrictions to ROW development and travel would be similar to Alternative D. Economic activity due to grazing on federal lands within Greater Sage-Grouse habitat would be similar to Alternatives B, D, and E. The economic effect from recreational activity would be similar to Alternatives B, D, and F. Reductions in economic activity from locatable minerals could occur but would be less than under Alternatives B and F. Reduction in economic activity from locatable minerals would be the same as under Alternatives B, C, D, and F. As with Alternatives B and D, the Proposed Plan would tend to favor conservation interests and would have an adverse effect on development interests. No disproportionately high and adverse impacts on minority or low-income populations would be expected from changes in management.

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4.3.2 Management Alignment Alternative

Table 4-3, below, summarizes if and how decisions in the Management Alignment Alternative were considered in the 2015 Final EIS. Issues needing further analysis are analyzed under the resource/resource use headings in this chapter.

Table 4-3
Impacts from Management Alignment Alternative

Plan Alignment Issue	Considered in 2015 Final EIS
Modifying HMA Boundaries	As part of the proposed action for Alternative E in the 2015 Final EIS, as defined in Action E-SSS-AM 9 found on page 2-197: "Greater Sage-Grouse management categories must be evaluated every 3-5 years, based on new or improved spatial data through a scientifically based, peer-reviewed process. Adjustments of the mapped management categories within the population management zone would be made without further analysis." The impacts on resources associated with Alternative E are contained in Chapter 4 of the 2015 Final EIS. Note: If the most current Greater Sage-Grouse HMA boundaries are adopted, the following changes would occur: PHMA: 44,000 acre decrease GHMA: 27,300 acre increase OHMA: 1,007,600 acre decrease
Removing Sagebrush Focal Areas	Alternatives B through F in the 2015 Final EIS did not include SFAs as a management area. The impacts on resources associated with Alternatives B through F are contained in Chapter 4 of the 2015 Final EIS.
Adaptive Management	Adaptive Management was analyzed as part of the 2015 Final EIS; see Section 2.7.1 on page 2-75.
Allocation Exception Process	Exceptions were outlined in the 2015 Final EIS according to specific resource uses or conditions. These are summarized in Section 2.5 of this document (No-Action Alternative) under the heading Issue: Allocation Exception Process. Although specific exceptions, modifications, and waivers were only analyzed for certain land uses, the 2015 Final EIS analyzed a range of alternatives that took into account the various impacts from different types of management actions associated with these land use allocations. Note: The No-Action Alternative of the 2015 Final EIS allowed for the disposal of lands within Greater Sage-Grouse HMAs.
Mitigation	The mitigation standard (net conservation gain) was analyzed in Alternative E of the 2015 Final EIS, including the use of the Nevada Conservation Credit System. See Sections 4.4.8, page 4-42; Section 4.5.8, page 4-85; Section 4.6.8, page 4-126; Section 4.9.7, page 4-186; Section 4.13.8, page 4-265; and Section 4.15, page 4-286.
Seasonal Timing Restrictions	Applying limited seasonal timing restrictions was analyzed in Alternative C of the 2015 Final EIS. See Sections 4.4.6; 4.5.6; 4.6.6; 4.9.5; 4.10.6; 4.13.6; 4.14.6; and 4.18.6.
Modifying Habitat Objectives	The Habitat Objectives (Table 2-2) for Greater Sage-Grouse were analyzed in the 2015 Final EIS. See Section 2.6.2, page 2-17 for additional information and Sections 4.4.7; 4.4.8; 4.4.10; and 4.5.9 for the analysis of Habitat Objectives under the Proposed RMPA/Final EIS and Alternatives A, B, D, E, and F of the 2015 Final EIS.

4.3.3 Proposed Plan Amendment

Table 4-3, above, summarizes if and how decisions in the Management Alignment Alternative were considered in the 2015 Final EIS. While there have been minor changes between the Proposed Plan

Amendment and the Management Alignment Alternative, the analysis completed in 2015, and hence, **Table 4-3** remains applicable to both the Management Alignment Alternative and the Proposed Plan Amendment.

4.4 INCOMPLETE OR UNAVAILABLE INFORMATION

The Council on Environmental Quality (CEQ) established implementing regulations for NEPA, requiring that a federal agency identify relevant information that may be incomplete or unavailable for evaluating reasonably foreseeable significant adverse impacts in an EIS (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS, unless the cost of obtaining such information is exorbitant. Knowledge and information is, and would always be, incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the 2015 Final EIS as well as this Proposed RMPA/Final EIS. The BLM made a considerable effort to acquire and convert resource data into digital format from the BLM and outside sources (e.g., NDOW, USGS, etc.).

Under the FLPMA, the inventory of public land resources is ongoing and continuously updated; however, certain information was unavailable for use in developing the Proposed RMPA/Final EIS. This was because inventories either had not been conducted or were incomplete.

Some of the major types of data that are incomplete or unavailable are the following:

- Comprehensive planning area-wide inventory of wildlife and special status species occurrence and condition
- GIS data used for disturbance calculations on private lands
- Site-specific surveys of cultural and paleontological resources
- Lack of quantifiable social or economic effects specific to counties, from the Statewide Socioeconomic Baseline Data collection for Nevada that is currently being developed by the University of Nevada, Reno

For these resources, estimates were made concerning their number, type, and significance, based on previous surveys and existing knowledge.

In addition, some impacts could not be quantified, given the proposed management actions. Where there was this gap, impacts were projected in qualitative terms or, in some instances, were described as unknown. Subsequent site-specific, project-level analyses would provide the opportunity to collect and examine site-specific inventory data to determine appropriate application of RMP-level guidance. In addition, the BLM and other agencies in the planning area continue to update and refine information used to implement this plan.

4.5 IMPACTS ON GREATER SAGE-GROUSE AND GREATER SAGE-GROUSE HABITAT

4.5.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

Under this alternative, 2,767,552 acres of Greater Sage-Grouse HMAs would be designated as SFAs and would be recommended for withdrawal from location and entry under the Mining Law of 1872 for 20 years, subject to valid existing rights. The potential for future mining operations that would affect Greater Sage-Grouse and its habitat would be reduced because additional protections from habitat

disturbance and fragmentation associated with mining would be placed on some of the most important landscapes for Greater Sage-Grouse conservation (as identified by the USFWS; BLM 2016b).

Based on the reasonably foreseeable development (RFD) scenario, estimates for the number and size of future mines and exploration projects in the planning area over the proposed 20-year withdrawal would not be substantially different (see **Table 4-4**, below). The difference, therefore, between the nature and type of effects on Greater Sage-Grouse described in Section 4.4.10 of the 2015 Final EIS would be negligible. A withdrawal within the SFA could have beneficial impacts on Greater Sage-Grouse by potentially reducing mining activities that may cause disturbance to Greater Sage-Grouse and its habitat within and adjacent to the withdrawal areas.

Table 4-4
Estimated Number of Mines and Exploration Projects

State	Inclusion of SFA		No SFA	
	Mines	Exploration	Mines	Exploration
Nevada	1	32	3	78
California	N/A	N/A	N/A	N/A

Source: BLM 2016b

4.5.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would be consistent with both Nevada and California's overall objective to provide for the long-term conservation of Greater Sage-Grouse by protecting the habitat upon which the species depends. Despite minor differences between the actions described in this alternative and those analyzed in the 2015 Final EIS, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.4 of the 2015 Final EIS. Alignment with the states' conservation and management strategies would improve coordination and opportunities for enhanced management.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. This would ensure that current and future renditions of HMA boundaries accurately reflect Greater Sage-Grouse habitat on the ground and guide management actions appropriately. As the boundaries are updated, the land use plan allocations associated with each HMA (see **Table 2-1**) would be adjusted to match the newest USGS map model (Coates et al. 2016). This would help to conserve the species by ensuring allocations and any of their associated restrictions are applied in the appropriate areas, while allowing infrastructure and economic development to occur in areas that would not affect the species.

The allocation exception process would be updated and standardized, to allow for the consideration of projects within PHMA, GHMA, and OHMA provided they meet the prescribed criteria, as described in **Table 2-2**. Because these criteria ensure that projects are either in unsuitable Greater Sage-Grouse habitat; do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse; or can be offset, with the exception of those needed for public health and safety, no new impacts on Greater Sage-Grouse and its habitat are anticipated above those analyzed in the 2015 Final EIS.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. This update would ensure that the BLM is utilizing the best available science, data and decision support tools to guide management at the appropriate spatial scale. Impacts on Greater Sage-Grouse and its habitat would be beneficial as a result of this update to adaptive management triggers, providing the ability to detect declining populations and/or habitat and change management on the ground.

The State of Nevada adopted a mitigation standard of net benefit (net conservation gain). Consistent with the State approach, this standard would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS. The improved coordination among state and federal partners, along with using consistent metrics for tracking changes in habitat quality and quantity over time, is anticipated to benefit the species through enhanced knowledge of baseline conditions and restoration/reclamation/mitigation effectiveness.

Beneficial impacts were identified for addressing seasonal timing restrictions and modifying indicators and their values in the Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) in the 2015 Final EIS, in coordination with the state wildlife agencies and other partners and others as described in **Table 2-2**. The criteria established for modifying or removing seasonal timing restrictions to ensure that these protections are still applied where applicable and allow for beneficial Greater Sage-Grouse projects (i.e., juniper and/or pinyon removal, riparian restoration projects, reseeding, etc.) to be implemented in an expedited manner. Modifying the Habitat Objectives would improve the accuracy of Greater Sage-Grouse habitat management by using the best available science to inform Greater Sage-Grouse seasonal habitat requirements.

SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying Greater Sage-Grouse HMAs and associated allocations and management decisions (PHMA, GHMA, or OHMA). Impacts on Greater Sage-Grouse would be consistent with those described in 2015 because SFAs presented no additional conservation or management restrictions above PHMA with the exception of the withdrawal recommendation discussed above. Given the subsequent information obtained through the 2016 SFA Draft EIS's associated Mineral Potential Report and Socioeconomic Impacts Analysis (BLM 2016b), the October 4, 2017, *Notice of Cancellation of Withdrawal Application and Withdrawal Proposal* explained that "the BLM determined the proposal to withdraw 10 million acres was unreasonable in light of the data that showed that mining affected less than 0.1 percent of Greater Sage-Grouse-occupied range."

4.5.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts and outcomes as described in section 4.5.2 for the Management Alignment Alternative. The Proposed Plan Amendment would remain consistent with both Nevada and California's overall objective to provide for the long-term conservation of Greater Sage-Grouse by protecting the habitat upon which the species depends. Despite minor differences between the actions described in the Proposed Plan Amendment and those analyzed in the 2015 Final EIS, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.4 of the 2015 Final EIS. Alignment with the states'

conservation and management strategies would improve coordination and opportunities for enhanced management.

Under the Proposed Plan Amendment, the adaptive management strategy would be revised as summarized and described in **Table 2-2** and **Appendix F**. The adaptive management strategy presented in the Proposed Plan Amendment has been modified to better align with the strategy approved by the State of Nevada's Sagebrush Ecosystem Council on July 17, 2018 and August 30, 2018. Habitat triggers have been replaced with a system of adaptive management warnings related to fire risk, wildland fire, anthropogenic and natural disturbances. If these warnings justify a response, this would be considered an adaptive management habitat trigger. Impacts on Greater Sage-Grouse and its habitat from this change to the adaptive management strategy would be beneficial, providing the ability to detect declining populations and/or habitat and change management on the ground with other Federal, state, and local partners. These warnings would also allow BLM to assess the threats that are present and widespread across the Nevada and Northeastern California Sub-region, which are wildfire and invasive plant species.

In accordance with the state of Nevada's adopted goal of seeking a net conservation gain for Greater-Sage Grouse, the Proposed Plan Amendment retains net conservation gain as a goal for the planning area, however, the mitigation standard that applies to third party actions is modified to reflect BLM's determination that compensatory mitigation must be voluntary unless required by other applicable law but in recognition that states may require mandatory compensatory mitigation in accordance with state law. Consistent therewith, the BLM would continue to require appropriate mitigation to adequately conserve Greater Sage-Grouse and its habitat and would pursue a net conservation gain as a broader planning goal and objective in alignment with State management plans and policy. The BLM would not deny a proposed authorization in Greater Sage-Grouse habitat solely on the grounds that the proponent has not proposed or agreed to undertake voluntary compensatory mitigation.

The BLM would continue to apply the mitigation hierarchy as described in the CEQ Regulations at 40 CFR 1508.20; however, the BLM would focus on avoiding, minimizing, rectifying or reducing impacts over time. Compensation, which involves replacing or providing substitute resources for the impacts (including payment) would only be considered when voluntarily offered by a proponent, in coordination with the States of Nevada and California; however, when authorizing third-party actions that would result in direct, indirect, or cumulative impacts on Greater Sage-Grouse or their habitat, the BLM would require those impacts to be quantified using the most current version of the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes to Greater Sage-Grouse habitat quality and quantity. The Proposed Plan Amendment also removes Appendix F, Mitigation, of the 2015 ROD/ARMPA and clarifies how the BLM would apply the mitigation hierarchy to comply with current policy and guidance.

The BLM has determined that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of the public lands. Consistent with that determination and with BLM IM 2018-093, Compensatory Mitigation, the Proposed Plan Amendment clarifies how voluntary compensatory mitigation or a state mitigation requirement or recommendation should be considered in the management of Greater Sage-Grouse habitat. This clarification simply aligns the Proposed Plan Amendment with BLM policy and the scope of compensatory mitigation authority expressly provided by FLPMA. Any analysis of

compensatory mitigation relating to future projects is speculative at this level of land use planning; therefore, analysis of compensatory mitigation is more appropriate for future project-specific NEPA. In other words, it is speculative to assume the impacts from voluntary compensatory mitigation at the planning level without knowing the frequency with which project proponents would proffer voluntary actions. The applicability and overall effectiveness of voluntary actions cannot be fully assessed until the project level when the specific location, design and impacts are known.

However, the effects of the changes to compensatory mitigation in the Proposed Plan Amendments would be nominal, in part, because the BLM would continue to ensure consistency of its actions and authorizations with the land use planning level goals and objectives of the Proposed Plan Amendments. The implementation of compensatory mitigation actions would be directed by MOAs that describe how the BLM would align with State authorities and incorporated in the appropriate NEPA analysis subsequent to the Proposed Plan Amendment. While the conservation benefit of compensatory mitigation may be limited when weighed against the threats to Greater Sage-Grouse, particularly in the Great Basin region where wildland fire remains a key threat, the BLM is committed to implementing state-imposed mitigation recommendations to help minimize the impacts of anthropogenic disturbance and habitat fragmentation throughout the range of Greater Sage-Grouse.

Further, the BLM is committed to implementing beneficial habitat management actions to reduce the threats of fire and invasive species to Greater Sage-Grouse. The BLM has committed resources to habitat restoration and has treated 1.4 million acres of Greater Sage-Grouse habitat range-wide over the past 5 years. In the federal government's fiscal year 2018 specifically, the BLM funded approximately $29 million in Greater Sage-Grouse management actions resulting in approximately 500,000 acres of treated habitat. The BLM expects to invest nearly $22 million in fiscal year 2019 through the implementation of habitat management projects in the Great Basin Region.

In 2015, the USFWS determined Greater Sage-Grouse was "not warranted" for listing under the Endangered Species Act. The USFWS found that BLM's 2015 land use plans were adequate regulatory mechanisms and that the species no longer warranted listing under the Act. At the time of that decision, USFWS acknowledged the RMP requirements that compensatory mitigation achieve a net gain standard. The BLM is not proposing any action that would preclude proponents from offering compensatory mitigation; it is clarifying the BLM's reliance on voluntary compensatory mitigation consistent with federal law.

Anecdotally, the existing conservation credit systems, banks, and exchanges designed to offset impacts to Greater Sage-Grouse or its habitat have had mixed success. The BLM is aware of three mitigation banks (one commercial bank agreement in Wyoming and two single-user bank agreements with mining companies in Nevada) and one exchange system in Colorado specific to Greater Sage-Grouse currently in operation. However, the BLM does not have access to data or information that would further assess the relative benefit provided by these systems.

In all designated Greater Sage-Grouse habitat, the BLM would ensure both mitigation and management actions that achieve the planning-level management goals and objectives identified in this RMPA. The BLM has a variety of tools available to effective achieve those management goals such as restoration projects and habitat improvements.

The BLM would continue plan effectiveness monitoring to provide the data needed to evaluate BLM actions toward reaching the goals and objectives set forth in the RMPAs. Effectiveness monitoring methods would encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this RMPA. Effectiveness data used for these larger-scale evaluations would include all lands in the area of interest, regardless of surface management, and would help inform where finer-scale evaluations are needed.

The criteria established for modifying or removing seasonal timing restrictions has been revised in the Proposed Plan Amendment through the addition of an exception to modify or waive seasonal timing restrictions to allow for priority routine administrative functions (consistent with the exceptions proposed for allocations). Prior to permitting this exception, BLM would still be required to coordinate with NDOW and/or CDFW to ensure the seasonal lifecycle periods that are necessary for the Greater Sage-Grouse are protected, while still allowing these types of functions to occur in a timely manner. Due to the fact that it would be speculative to anticipate at the land use planning level how often and when this exception would be pursued on a project-by-project basis, impacts would be more appropriate at the project scale.

4.6 IMPACTS ON VEGETATION AND SOILS

4.6.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

Under this alternative, 2,767,552 acres of Greater Sage-Grouse habitat management areas would be designated as SFAs, and would be recommended for withdrawal from location and entry under the Mining Law of 1872 for 20 years, subject to valid existing rights. Under this alternative, less mining activity would be authorized (see **Table 4-4**, above), thus reducing the overall potential for disturbance associated with mining activities.

The reduction in overall disturbance would provide a positive benefit to vegetation and soils; however, because localized disturbance from mining activities requires reclamation and is only one factor affecting the extent and condition of vegetation and soils, the designation of SFAs is unlikely to result in a substantially different outcome for vegetation and soils as those described in Section 4.5.10 of the 2015 Final EIS.

4.6.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would not substantially alter vegetation and soil resources because they would continue to be managed according to their underlying habitat management area and associated allocations and management decisions (PHMA, GHMA, or OHMA). Despite minor differences between the actions described in this alternative and those analyzed in the 2015 Final EIS, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.5 of the 2015 Final EIS.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The allocations associated with each HMA (**Table 2-2**) would be adjusted based on updates to the USGS map model (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix D**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2015 ARMPA/ROD. Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) indicators and values would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying HMA and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.6.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on vegetation and soil resources as described in section 4.6.2 for the Management Alignment Alternative, except that under the Proposed Plan Amendment, the adaptive management strategy would be revised as summarized and described in **Table 2-2** and **Appendix F**. Impacts on vegetation and soil resources from the modifications identified in **Appendix F** would be beneficial, providing the ability to address fire risk in a collaborative and expeditious manner, which would beneficially impact vegetation and soil resources. The proposed adaptive management strategy would allow BLM to assess the threats that are present and widespread across the Nevada and Northeastern California Sub-region, which are wildfire and invasive plant species.

The criteria established for modifying or removing seasonal timing restrictions has been revised in the Proposed Plan Amendment through the addition of an exception to modify or waive seasonal timing restrictions to allow for routine administrative functions (consistent with the exceptions proposed for allocations). Due to the fact that it would be speculative to anticipate at the land use planning level how often and when this exception would be pursued on a project-by-project basis, impacts would be more appropriate at the project scale.

4.7 Impacts on Land Use and Realty

4.7.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The designation of SFAs would be specific to recommending lands for withdrawal from location and entry under the Mining Law of 1872. Because this would not alter the underlying allocations for land use and realty associated with Greater Sage-Grouse HMAs, the nature and type of effects on land use and realty described in Section 4.13.10 of the 2015 Final EIS (BLM 2015a) would be the same as under this alternative.

4.7.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would result in boundary adjustments for where land use and realty allocations are applied. Given the relatively minor shift in PHMA (-0.5 percent) and GHMA (+0.5 percent), these changes would not result in discernible differences from the No-Action Alternative. The decrease in OHMA (-17 percent) would have negligible impacts on land use and realty, as there are limited allocation decisions tied to OHMA; therefore, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.13 of the 2015 Final EIS (BLM 2015a).

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (**Table 2-2**) would be adjusted to align with the USGS map model, as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet the prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative and the No-Action Alternative, with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS. Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) indicators and values would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying habitat management area designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.7.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on land use and realty resources as described in section 4.7.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would have no measurable effects on the land use and realty program.

4.8 IMPACTS ON RENEWABLE ENERGY RESOURCES

4.8.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The designation of SFAs would be specific to recommending lands for withdrawal from location and entry under the Mining Law of 1872. Because this would not alter the underlying allocations for renewable energy resources associated with Greater Sage-Grouse HMAs, the nature and type of effects on renewable energy resources described in Section 4.14.10 of the 2015 Final EIS would be the same as under this alternative.

4.8.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would result in boundary adjustments for where renewable energy allocations are applied. Given the relatively minor shift in PHMA (-0.5 percent) and GHMA (+0.5 percent), these changes would not result in discernible differences from the No-Action Alternative. The decrease in OHMA (-17 percent) would make additional areas available for solar development in Nevada only, but this is not expected to result in increased development proposals based on the reasonably foreseeable development scenarios discussed in the 2015 Final EIS.

Therefore, the difference between the nature and type of impacts described would not be discernable without specific, new applications or project proposals, regarding development in those areas. These impacts are discussed in Section 4.14 of the 2015 Final EIS.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (**Table 2-2**) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS. Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) indicators and values would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying habitat management area designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.8.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on renewable energy resources as described in section 4.8.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would have no measurable effects on renewable energy resources.

4.9 IMPACTS ON MINERALS AND ENERGY

4.9.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The nature and type of effects on leasable minerals (geothermal and oil and gas), salable minerals, and solid (non-energy) leasable minerals as described in Section 4.15.10 of the 2015 Final EIS would be the same. The inclusion of SFAs would be specific to recommending lands for withdrawal from location and entry under the Mining Law of 1872, which would not affect the land use allocations associated with leasable minerals.

The withdrawal of 2,767,552 acres of BLM-administered lands in Nevada from location and entry under the Mining Law of 1872 for a period of 20 years would reduce the estimated number of future mines and exploration projects in the state (BLM 2016b). Because this withdrawal would not apply to valid existing rights, the designation of SFAs is only expected to reduce the number of new mines from three down to one during the initial 20- year withdrawal. As identified in Table 4-7 of the 2016 SFA Draft EIS, exploration projects would see a sharper decline with the inclusion of SFAs, dropping from an estimated 78 new projects down to 32 during the initial 20-year withdrawal.

When compared with the Management Alignment Alternative, which does not include SFAs, the withdrawal of 2,767, 552 acres to locatable minerals would reduce access and availability of geology and mineral resources in Nevada because the number of new mines would be reduced by 33 percent and the number of exploration projects would be reduced by 41 percent (BLM 2016b). The reduction in

mining activity would also result in socioeconomic impacts, which are discussed below in **Section 4.10.1**.

4.9.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would result in boundary adjustments for where minerals and energy allocations are applied. Given the relatively minor shift in PHMA (-0.5 percent) and GHMA (+0.5 percent), these changes would not result in discernible differences from the No-Action Alternative. The decrease in OHMA (-17 percent) would be negligible, as there are limited allocation decisions tied to OHMA; therefore, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.15 of the 2015 Final EIS.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (**Table 2-2**) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS.

Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying habitat management area designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.9.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on minerals and energy resources as described in section 4.9.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would have no measurable effects on the minerals and energy program.

4.10 IMPACTS ON SOCIOECONOMICS

4.10.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The withdrawal of 2,767,552 acres of BLM-administered lands in Nevada from location and entry under the Mining Law of 1872 for a period of 20 years would have additional socioeconomic impacts beyond those described in Section 4.21 and 4.22 of the 2015 Final EIS. Based on the RFD scenario presented in the 2016 SFA Draft EIS, withdrawal would lead to broad economic impacts on the national and international mining industry (BLM 2016b). While extensive areas of BLM-administered lands in Nevada

would remain open to mining, the mining industry could be adversely affected from having less potential locations to explore and develop.

The economic impacts in Nevada would differ considerably depending on whether the one new mine that was developed was a large gold/silver mine or a smaller barite mine. The best estimate is that future mines would support $133 million in annual output, 267 to 388 jobs, and between $20.5 and $35.7 million in annual labor income. Relative to the Management Alignment Alternative, which does not include SFAs, withdrawal would support between 414 to 739 fewer jobs in Nevada (primarily Elko, Humboldt, and Washoe Counties), and between $25.8 and $56.5 million less in annual labor income (BLM 2016b).

SFA designation would also reduce the number of exploration projects from 78 to 32 based on RFD scenarios for Nevada. As a result, exploration expenditures would be expected to fall by approximately 41 percent (approximately $3.8 million, as opposed to $9.1 million; BLM 2016b). The reduction in future mining operations could have tangible social impacts in Elko and Humboldt Counties. In particular, the potential reduction in future employment opportunities in the mining sector could lead to an increase in future unemployment and/or potential future out migration of some of the workers in that sector. Intangible social impacts from the SFA designation could be larger than the tangible social impacts, particularly outside of Elko and Humboldt Counties.

4.10.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative, and not recommending SFAs for withdrawal, could lead to a corresponding increase in populations and employment for the counties that would see new mine development. Within the analysis area, the projected economic impacts from operation of future mines would result in 801 jobs, a labor income of $62 million, and approximately $12 million in state/local tax revenue. With the exception of not including SFAs, the difference between the nature and type of impacts described would be negligible given the similarity of the alternatives. These impacts are discussed in Section 4.21 of the 2015 Final EIS and 4.3.6 of the 2016 SFA Draft EIS (BLM 2016b).

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each habitat management area (**Table 2-2**) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within Greater Sage-Grouse HMA, provided they meet prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in **Appendix F** (Adaptive Management).

Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for

withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying habitat management area designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.10.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on socioeconomics across the sub-region as described in section 4.10.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would be beneficial to state and local economies, as state and local administrative functions (in coordination with state wildlife agencies and other partners) may be permitted to move forward with shortened and/or waived seasonal timing restrictions, thus allowing these projects to occur in a more expeditious manner. In addition, threats to Greater Sage-Grouse habitat would be addressed in a more collaborative and expeditious manner based on the refinements outlined in the adaptive management strategy (**Appendix F**), which would benefit local economies that are impacted by similar threats such as wildfire and invasive plant species.

4.11 IMPACTS ON LIVESTOCK GRAZING

4.11.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The designation of SFAs would be specific to recommending lands for withdrawal from location and entry under the Mining Law of 1872. Because this would not alter the underlying allocations for livestock grazing associated with Greater Sage-Grouse HMAs, the nature and type of effects on livestock grazing described in Section 4.10.10 of the 2015 Final EIS would be the same as under this alternative.

4.11.2 Management Alignment Alternative

Despite minor differences between the actions described in the Management Alignment Alternative and those analyzed in the 2015 Final EIS, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.10 of the 2015 Final EIS.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (**Table 2-2**) would be adjusted to align with the USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS.

Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be

managed according to their underlying HMA designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.11.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on livestock grazing as described in section 4.11.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would have no measurable effects on the livestock grazing program.

4.12 Impacts on Comprehensive Travel Management

4.12.1 No-Action Alternative with the Inclusion of SFAs (No-Action Alternative)

The designation of SFAs would be specific to recommending lands for withdrawal from location and entry under the Mining Law of 1872. Because this would not alter the underlying allocations for travel and transportation management associated with Greater Sage-Grouse HMAs, the nature and type of effects on travel and transportation management described in Section 4.12.10 of the 2015 Final EIS would be the same as under this alternative.

4.12.2 Management Alignment Alternative

Adopting the changes proposed in the Management Alignment Alternative would result in boundary adjustments for where travel and transportation allocations are applied. Given the relatively minor shift in PHMA (-0.5 percent) and GHMA (+0.5 percent), these changes would not result in discernible differences from the No-Action Alternative. The decrease in OHMA (-17 percent) would have negligible impacts on Comprehensive Travel Management, as there are limited allocation decisions tied to OHMA; therefore, the difference between the nature and type of impacts described would be negligible. These impacts are discussed in Section 4.12 of the 2015 Final EIS.

The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each habitat management area (**Table 2-2**) would be adjusted to align with the USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in **Table 2-2**, to allow for the consideration of projects within HMAs, provided they meet the prescribed criteria.

Adaptive management hard and soft triggers would be updated as summarized and described in **Table 2-2** and **Appendix F**. The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative), with additional clarification regarding implementation provided in Appendix F of the 2018 Draft RMPA/EIS. Seasonal timing restrictions and modifying Habitat Objectives (Table 2-2 of the 2015 ARMPA/ROD) would be addressed in coordination with state wildlife agencies and other partners as described in **Table 2-2**. SFAs would not be designated under this alternative and therefore not recommended for withdrawal from location and entry under the Mining Law of 1872; however, they would still be managed according to their underlying HMA designation and associated allocations and management decisions (PHMA, GHMA, or OHMA).

4.12.3 Proposed Plan Amendment

Adopting the changes in the Proposed Plan Amendment would result in similar impacts on comprehensive travel management as described in section 4.12.2 for the Management Alignment Alternative. The adjustments made between the Management Alignment Alternative and the Proposed Plan Amendment regarding adaptive management and seasonal timing restrictions would have no measurable effects on the comprehensive travel management program.

4.13 CUMULATIVE EFFECTS ANALYSIS

This section presents the anticipated cumulative impacts on the environment that could occur from implementing the alternatives presented in **Chapter 2**. A cumulative impact is the impact on the environment that results from the incremental impact of the action, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such actions.

Cumulative impacts can result from individually minor, but collectively significant actions taking place over time. The cumulative impacts resulting from the implementation of the alternatives in this Proposed RMPA/Final EIS may be influenced by other actions, as well as activities and conditions on other public and private lands, including those beyond the planning area boundary. These include the concurrent Forest Service planning effort to amend land management plans for National Forests in Idaho, Montana, Nevada, Utah, Colorado, and Wyoming, which were previously amended in September 2015 to incorporate conservation measures to support the continued existence of the Greater Sage-Grouse. As a result, the sum of the effects of these incremental impacts involves determinations that often are complex, limited by the availability of information and, to some degree, subjective.

This Proposed RMPA/Final EIS incorporates by reference the analysis in the 2015 Final EIS and the 2016 SFA Draft EIS, which comprehensively analyzed the cumulative impacts associated with these planning decisions under consideration in that process. The 2015 Final EIS, and to some degree the 2016 SFA Draft EIS evaluated the cumulative impacts associated with the No-Action Alternative in this Proposed RMPA/Final EIS. The Management Alignment Alternative's and Proposed Plan Amendment's impacts are effectively within the range of effects analyzed by the 2015 Final and 2016 SFA Draft EISs. The 2015 Final EIS is quite recent, and the BLM has determined that conditions in the Nevada and Northeastern California Sub-region have not changed significantly based, in part, on the USGS science review (see **Chapter 3**), as well the BLM's review of additional past, present, and reasonably foreseeable actions in 2018. Conditions on public land have changed little since the 2015 Final EIS, and to the extent that there have been new actions or developments, the impacts associated with those actions or developments are in line with the projections in the 2015 Final EIS regarding reasonably foreseeable future actions and effects. Additionally, changes that have occurred on a smaller scale, like wildfires, received prompt responses. Since the nature and context of the cumulative effects scenario has not appreciably changed since 2015, and the 2015 analysis covered the entire range of the Greater Sage-Grouse, the BLM's consideration of cumulative effects in the 2015 Final EIS adequately addresses most, if not all, of the planning decisions to be made through this planning effort.

While the cumulative impacts analysis in the 2015 Final EIS offers a comprehensive foundation for this planning effort, the BLM is improving upon that analysis by integrating additional quantitative analysis specific to this planning effort. The purpose of this additional analysis is to facilitate a comparison of allocation decisions between the No-Action and Management Alignment Alternatives and the Proposed

Plan Amendment at scales beyond the individual planning areas associated with the 2018 amendment process. Our analysis focuses on the relevant changes in habitat delineations and allocation decisions each BLM state office is proposing and how those changes may impact our understanding of cumulative effects at the WAFWA MZ scale.

Conservation and management partners sought to work in advance of the 2015 USFWS listing decision to develop conservation objectives for the Greater Sage-Grouse that could help direct conservation and management actions for the species. Upon further review of the best available science and commercial information, the USFWS concluded in 2010 that the Greater Sage-Grouse warranted protection under the Endangered Species Act (ESA). Two factors leading to the decision to list the species as "warranted but precluded" were threats to habitat and the inadequacy of existing regulatory mechanisms. In 2012, at the request of the Sage Grouse Task Force team (SGTF), state and federal representatives produced a report that identified the most significant areas for Greater Sage-Grouse conservation, the principal threats within those areas, and the degree to which such threats need to be reduced or ameliorated to conserve the Greater Sage-Grouse so that it would not be in danger of extinction or likely to become so in the foreseeable future.

A principal component of Greater Sage-Grouse management is the implementation of mitigation actions to ameliorate the threats and impacts on Greater Sage-Grouse and its habitats. In 2015, the USFWS determined Greater Sage-Grouse was "not warranted" for listing under the ESA. The USFWS found that BLM's 2015 LUPs were adequate regulatory mechanisms and that the species no longer warranted listing under the ESA. At the time of that decision, the USFWS acknowledged the RMP requirements that compensatory mitigation achieve a net gain standard. The BLM is not proposing any action that would preclude proponents from offering compensatory mitigation; it is clarifying the BLM's reliance on voluntary compensatory mitigation consistent with federal law.

While the BLM has more than 90 RMPs, 9 strategies, and 45 agreements in active use that contain or address compensatory mitigation, the BLM has identified only limited implementation of compensatory mitigation consistent with the 2015 Greater Sage-Grouse Plans. Using data gathered in 2017, the BLM identified 13 Greater Sage-Grouse projects across 5 BLM states with a mandatory compensatory mitigation component or net gain standard implemented between October 2008 and June 2017. The most common compensatory mitigation actions used by the BLM in those cases were habitat restoration, habitat improvements, rangeland improvements, and invasive species control – actions consistent with the BLM's own investment in management actions as described previously. It many cases, it is still too soon in the implementation of these compensatory mitigation actions to measure the effectiveness or degree of benefit each action provides.

Currently BLM has six state-specific RMPA efforts that are all aligning compensatory mitigation with their relevant State authorities. All of the Proposed Plan Amendments modify the existing standard for compensatory mitigation, but maintain that the BLM would pursue conservation efforts as a broader planning goal and objective. Cumulatively, if the BLM is implementing planning decisions across the broader range, such actions would preclude any cumulative impacts from modifying the net conservation gain standard at the project level.

The BLM has updated certain data that it collected and evaluated in the 2015 Final EIS concerning the 2015 plan allocation decisions to reflect maintenance-related changes, adaptive management responses, and refined source data. The BLM used these data to represent the No-Action Alternative for the

current plan analysis. The BLM also identified 2015 data which are not subject to change in any alternatives associated with the 2018 planning process. These data were carried forward as the alternative allocation decision data. The BLM also provided allocation decision data representing changes included in the Management Alignment Alternative in the Proposed RMPA/Final EIS, which were then used in the comparative analysis.

The BLM analyzed cumulative effects at two levels in the 2019 planning process. Each State analyzed cumulative effects across the Greater Sage-Grouse range by considering, for all BLM states, reasonably foreseeable future actions and their effects in every WAFWA Management Zone (MZ; excluding WAFWA MZ VI). Each state further analyzed cumulative effects at the WAFWA MZ level for their state. See **Sections 4.13.1** and **Appendix H** for the range wide analysis, which addresses the cumulative effects from reasonably foreseeable future actions across all WAFWA MZs, including those that do not connect directly to Nevada and California. See the Nevada/California WAFWA MZ analysis in **Sections 4.13.5, 4.13.6, and 4.13.7** below. Both analyses use WAFWA MZs. The Nevada/California WAFWA MZ analysis included MZs III, IV and V which include all or portions of Nevada, California, Oregon, Idaho, and Utah (**Figure 4-1**).

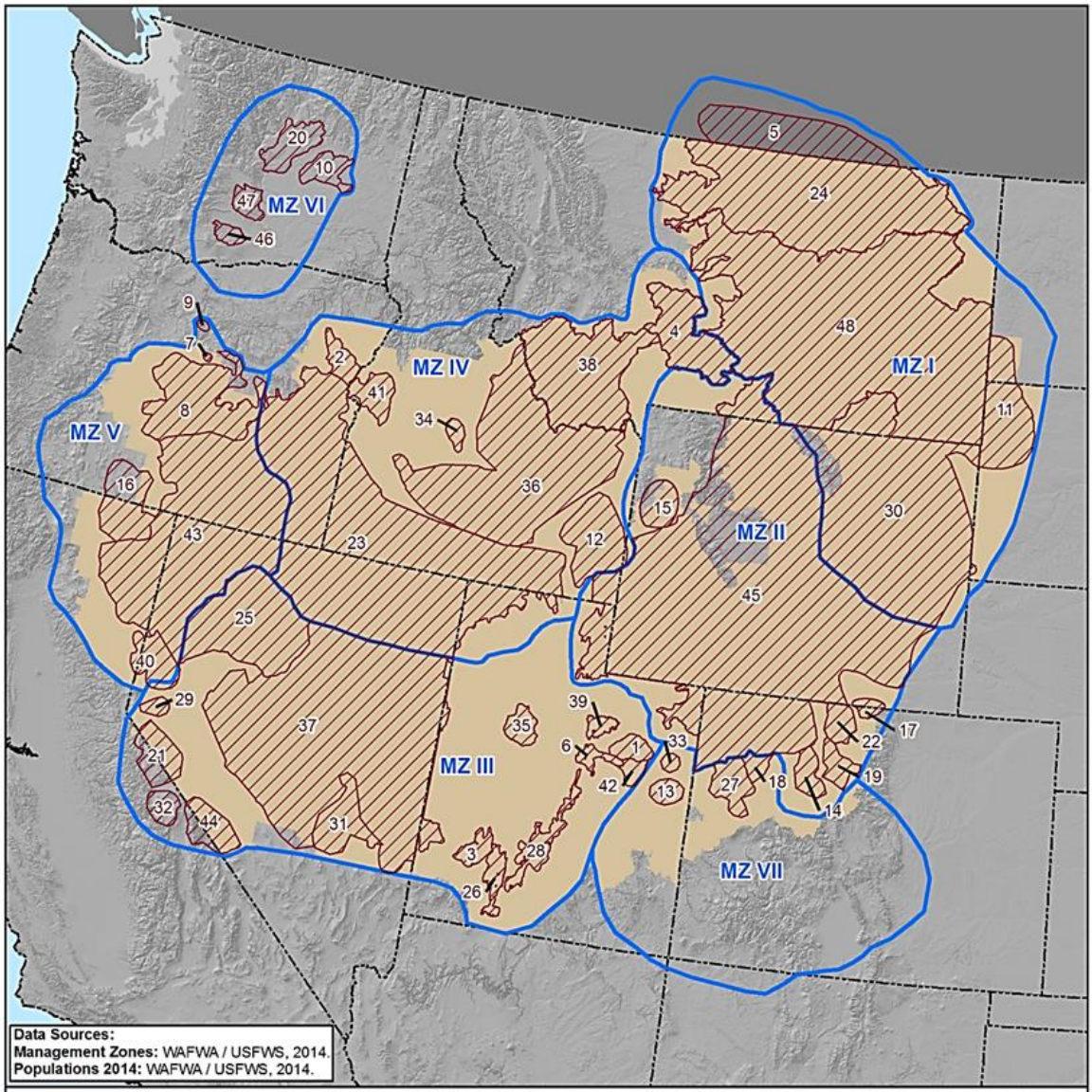
4.13.1 Range-wide Cumulative Effects Analysis - Greater Sage-Grouse

The 2015 ARMPA/ROD is the No-Action Alternative in this SEIS and was part of the cumulative impact analysis for Greater Sage-Grouse at the WAFWA MZ scale in the 2015 Final EIS (see Table 4-4 of the 2015 Final EIS). Additionally, the cumulative impacts anticipated from the Management Alignment Alternative and the Proposed Plan Amendment presented in this SEIS are entirely within the range of effects analyzed by the 2015 Final EIS. While the analysis for the 2015 Final EIS is quite recent, the BLM has reviewed conditions in Nevada and northeastern California to verify that they have not changed significantly. Conditions on BLM-administered lands have changed little since the 2015 Final EIS, and to the extent that there have been new actions or developments, the impacts associated with those actions or developments are in line with the projections in the 2015 Final EIS regarding reasonably foreseeable future actions and effects.

The BLM's assessment that conditions and cumulative impacts have not changed significantly is based, in part, on the USGS science review (see **Chapter 3**) and the BLM's review of additional past, present, and reasonably foreseeable actions in 2018. Since the nature and context of the cumulative effects scenario have not appreciably changed since 2015, and the 2015 plans included analysis by WAFWA MZ across the entire range of the Greater Sage-Grouse, the cumulative effects analysis in the 2015 Final EIS applies to this planning effort and provides a foundation for the BLM to identify any additional cumulative impacts.

The remainder of this chapter and related appendices includes additional quantitative analysis using the existing cumulative impacts across the range and integrating additional quantitative analysis specific to this planning effort to provide a comprehensive range-wide view of cumulative impacts. The purpose of this additional analysis is to facilitate a comparison of allocation decisions between the No-Action and Management Alignment Alternatives and the Proposed Plan Amendment at scales beyond the individual planning areas associated with the 2018 amendment process. The analysis focuses on the relevant changes in habitat delineations and allocation decisions each BLM state office is proposing and how those changes may affect the understanding of cumulative effects at the WAFWA MZ scale across the Greater Sage-Grouse's range.

Figure 4-1 – Cumulative Effects Analysis Extent, Sage-Grouse Management Zones and Populations



Under the Management Alignment Alternative, the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872 would be removed, as the EIS process considering the proposed withdrawal was canceled on October 11, 2017. In its 2016 SFA Draft EIS, the BLM quantified the possible adverse effects from locatable mineral exploration and mining on the approximately 10 million acres of SFAs proposed for withdrawal, finding that they would be limited to approximately 9,000 acres rangewide of surface disturbance over 20 years, with approximately 0.58 percent of Greater Sage-Grouse male birds possibly affected per year. The other action alternatives evaluated in the 2016 SFA Draft EIS similarly demonstrated negligible benefit of the proposed withdrawal to Greater Sage-Grouse and its habitat.[1]

The cumulative effects of implementing the Management Alignment Alternative are as described in the 2016 SFA Draft EIS, under the No-Action Alternative, in which SFAs are not carried forward for withdrawal. Greater Sage-Grouse would not be affected as a result of the removal of the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872, as the recommendation itself does not have any on-the-ground effects. Conservation benefits of a future withdrawal would be minimal, as documented in the 2016 SFA Draft EIS and as explained above; therefore, there would be negligible cumulative impacts associated with the decision to remove the SFA designation. The direct and indirect impact analysis specifically enumerates how each BLM allocation decision to apply NSO stipulations and waivers, exceptions, or modifications overlaps with the SFA designation.

4.13.2 Why Use the WAFWA Management Zone?

The WAFWA represents state and provincial fish and wildlife agencies and supports sound resource management and building partnerships to conserve wildlife for the use and benefit of all citizens, now and in the future. The BLM is analyzing habitats and allocation decisions at the scale of the six WAFWA-delineated Greater Sage-Grouse MZs within which the plan amendments are occurring to enable the decision maker to understand the impacts on Greater Sage-Grouse at a biologically meaningful scale. **Appendix H** includes a map that depicts the WAFWA MZs across the range of the Greater Sage-Grouse. The MZs were delineated based on floristic provinces (identified by Connelly et al. 2004) within which the vegetative communities comprising Greater Sage-Grouse habitat as well as the Greater Sage-Grouse populations are responding similarly to environmental factors and management decisions (Stiver et al. 2006).

The cumulative effects analysis area for Greater Sage-Grouse extends beyond a state, political, or planning area boundary to reflect the WAFWA MZs because they encompass areas with similar issues, threats, and vegetative conditions important Greater Sage-Grouse habitat management. Each suite of threats to specific Greater Sage-Grouse populations have been identified in the USFWS's 2013 Conservation Objectives Team (COT) Report, the 2015 Regional RODs (BLM 2015c), and the USFWS' 2010 Listing Decision. The 2015 Regional RODs (BLM 2015c) identify how planning level allocation decisions address the identified threats to populations, which are aggregated in this analysis by MZs. The

[1]Importantly, mining operations that do occur are subject to regulation under the BLM's surface management regulations at 43 CFR 3809. These regulations ensure that operators comply with environmental standards in conducting exploration, mining, and reclamation. For example, the BLM must approve a plan of operations for locatable mining operations on public lands, which includes compliance with the NEPA, National Historic Preservation Act, and ESA. Plans of operation must also include those measures to meet specific performance standards and to prevent unnecessary or undue degradation of the lands (43 CFR 3809.411).

threats vary geographically and may have more or less impact on Greater Sage-Grouse and its habitat in some parts of the MZs, depending on such factors as climate, land use patterns, and topography.

Table 4-5 shows the resource and location of applicable cumulative effects analysis from 2015 Final EIS. Unless otherwise addressed in this chapter, the cumulative effects of the alternatives analyzed in this SEIS are covered by the 2015 Final EIS and the 2016 SFA Draft EIS. This includes the incremental impacts across the range of BLM- and Forest Service-administered lands being amended in concurrent plan amendment efforts. See the 2015 Final EIS for additional information.

The sum of past, present, and reasonably foreseeable actions listed in **Appendix H** represent cumulative effects across the range of Greater Sage-Grouse habitat and HMAs. These effects are important to consider for future management of the species as a whole and are not solely being analyzed at the local or state level.

Table 4-5
Cumulative Effects Analysis Incorporated by Reference

Resource Topic	Location of Cumulative Effects Analysis and Updated Impacts Analysis
Greater Sage-Grouse	Chapter 5, Section 5.1 of the 2015 Final EIS and Chapter 4 of the 2016 SFA Draft EIS, Section 4.5.9. Additional information regarding Greater Sage-Grouse is included in **Chapter 4**, **Section 4.5**, of this SEIS.
Vegetation and Soils	Chapter 5, Section 5.4 of the 2015 Final EIS and Chapter 4 of the 2016 SFA Draft EIS, Section 4.4.9. Additional information regarding Vegetation and Soils is included in **Chapter 4**, **Section 4.6**, of this SEIS.
Land Use and Realty	Chapter 5, Section 5.12 of the 2015 Final EIS. Additional information regarding Land Use and Realty is included in **Chapter 4**, **Section 4.7**, of this SEIS.
Renewable Energy	Chapter 5, Section 5.13 of the 2015 Final EIS. Additional information regarding Renewable Energy is included in **Chapter 4**, **Section 4.8**, of this SEIS.
Minerals and Energy	Chapter 5, Section 5.14 of the 2015 Final EIS and Chapter 4 of the 2016 SFA Draft EIS, Section 4.2.9. Additional information regarding Minerals and Energy is included in **Chapter 4**, **Section 4.9**, of this SEIS.
Socioeconomics	Chapter 5, Section 5.19 of the 2015 Final EIS and Chapter 4 of the 2016 SFA Draft EIS, Section 4.3.13. Additional information regarding Socioeconomics is included in **Chapter 4**, **Section 4.10**, of this SEIS.
Livestock Grazing	Chapter 5, Section 5.9 of the 2015 Final EIS. Additional information regarding Livestock Grazing is included in **Chapter 4**, **Section 4.11**, of this SEIS.
Comprehensive Travel Management	Chapter 5, Section 5.11 of the 2015 Final EIS. Additional information regarding Comprehensive Travel Management is included in **Chapter 4**, **Section 4.12**, of this SEIS.

This section describes the threats to Greater Sage-Grouse and its habitat. The magnitude of change between the No-Action Alternative and Proposed Plan Amendment, by decision, is represented in pie charts and tables within this section and in **Appendix H**. Those effects, in addition to synthesizing the plan decisions and comparing the current condition to the condition that would be in effect when the proposed plans are finalized, allow for a comparison of the change in management direction within MZs and across planning regions.

Habitat fragmentation and disturbance from energy development, mining, and infrastructure remain the greatest threat to Greater Sage-Grouse in the Rocky Mountain region. Wildfire threat remains a concern in the Rocky Mountain Region and is the greatest threat to Greater Sage-Grouse in the Great Basin Region as well as invasive plant species. Between 2008 and 2018, wildfires burned an average of 900,000 acres per year in Greater Sage-Grouse habitat range-wide; this is within the range of projected wildland fire analyzed in the 2015 Final EIS. The BLM has committed resources to habitat restoration and has treated 1.4 million acres of Greater Sage-Grouse habitat range-wide over the past 5 years.

The interagency (including the BLM) WAFWA-led Wildfire and Invasive Species Working Group reviewed recent information for their May 2018 Gap Report Update to the Wildfire and Invasive Plant Species in the Sagebrush Biome: Challenges That Hinder Current and Future Management and Protection report (Mayer 2018). They found that all of the original challenges related to control and reduction of the invasive annual grass/fire cycle were still relevant (policy, fiscal, and science challenges) and they pointed to three new gaps involving program capacity, resource specialists, and developing guidelines on drought and climate adaption to manage sagebrush ecosystems.

The increased flexibility proposed in these Proposed Plan Amendments can allow for responsible development of other uses in Greater Sage-Grouse HMAs and may reduce costs to proponents but is not expected to result in a large increase in development proposals on public land. Similarly, the increased protections from the 2015 Final EIS have not resulted in a large decrease in right-of way (ROW) applications or an increase in rejected applications; therefore, the changes proposed under the Management Alignment Alternative and Proposed Plan Amendment are not expected to result in large changes to the rate of development across the range, or in its economy.

Some 350 obligate species of plants and wildlife rely on the sagebrush steppe ecosystems and coexist with Greater Sage-Grouse. They may be similarly affected by development or disturbance; however, nothing in the considered alternatives would lessen the BLM's authority or responsibility to provide for the needs of special status species, as described in BLM's land use plans, policies, and laws, including Manual 6840, the ESA, and FLPMA. Increased flexibility for other uses within Greater Sage-Grouse habitat does not necessarily increase potential impacts on other wildlife or plant species. Site-specific NEPA analysis, including an evaluation of impacts on special status species, is required for on-the-ground projects within the planning area.

4.13.3 Cumulative Effects on Greater Sage-Grouse: Management Zone I

In addition to the analysis in the 2015 Final EIS in Table 4-4, other anticipated incremental impacts are discussed below in association with planning issues being analyzed in this SEIS.

MZ I encompasses portions of Wyoming, Montana, North Dakota, and South Dakota. Montana is currently not undergoing a plan amendment process; therefore, none of the proposed changes described in this section apply to Greater Sage-Grouse in Montana. Under the Proposed Land Use Plan Amendments in WAFWA MZ I, PHMA and GHMA designations would not change from those identified in the No-Action Alternative. In addition, no changes in allocations are proposed in either of the planning areas in this MZ. Approximately 16 percent of the planning area across MZ I is designated as PHMA, and 38 percent is GHMA. Future adjustments to PHMA and GHMA in MZ I would be based on best available science and to align with the respective states' delineations for Greater Sage-Grouse HMAs.

Wyoming's current planning effort, and Montana's existing plans, incorporate management flexibility to allow for site specific adjustments to land use plan authorizations for adaptive management strategies, livestock grazing management, and other proposed land uses. The use and application of compensatory mitigation in the planning area would follow the respective State plans, resulting in greater consistency across the MZs. For these actions, cumulative impacts on Greater Sage-Grouse habitat and populations across MZ I would be consistent with those impacts described in the 2015 Final EISs for the then Proposed Plan Amendments. The currently Proposed Plan Amendment changes from the No-Action Alternative are minor, and still maintain prescriptive management for Greater Sage-Grouse habitat across the MZ for surface disturbing activities. Disturbance from energy development, mining, and infrastructure, as well as the resulting habitat fragmentation, remain the greatest threat to Greater Sage-Grouse in the Rocky Mountain Region. Because the land use prescriptions and allocations are not proposed for change in Wyoming's land use plan amendment, there would be no additional cumulative impact on Greater Sage-Grouse populations or habitat within MZ I.

A summary of potential cumulative impacts by proposed management action is presented below.

Impacts on Greater Sage-Grouse as a result of surface disturbance would likely be greater where development and disturbance are more intense and in areas where development overlaps sensitive habitats. The degree of impact would depend on the timing of development activities and whether the amount of development activity and disruption outpaces successful reclamation and revegetation efforts in disturbed areas. Increased flexibility for updating HMAs across MZ I would not result in any additive impacts on Greater Sage-Grouse and could result in beneficial impacts as a result of consistent management across the MZ. Any future modifications of HMAs would be documented using the appropriate level of NEPA if applicable, that would provide analysis regarding any potential impacts; however, because the underlying HMA allocations and the respective restrictions on those allocations put in place to conserve Greater Sage-Grouse would not change, and any proposed updates would reflect the most recent knowledge concerning Greater Sage-Grouse habitat utilization and distribution, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse habitat or population.

Approximately 99 percent of GHMA and PHMA habitat in MZ I is open to livestock grazing, and this is not proposed for change in Wyoming's proposed land use plan amendment; Montana is also not proposing any changes to livestock management at this time; therefore, no additional cumulative impacts beyond those identified in the 2015 Final EISs are anticipated. In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could cause changes in habitat. Changes in plant composition could occur in varying degrees and could change vegetation structure, affecting cover for nesting birds; however, grazing can be used to reduce fuel loads and reduce the risk of wildfire and can also be managed to reduce the spread of invasive grasses.

Much of the landscape in MZ I is adapted to withstand grazing disturbance, having been grazed by bison before the West was settled. In addition, the BLM has applied Standards for Rangeland Health since 1997 in order to enhance sustainable livestock grazing and wildlife habitat, while protecting watersheds and riparian ecosystems. Under proposed management in MZ I, the BLM would be able to adjust forage levels to meet rangeland health standards based on site-specific information that would inform livestock

management decisions. While the Proposed Plan Amendment in Wyoming would remove the Greater Sage-Grouse specific language in Management Action 4 (see Table 2-1, Permit Renewals, in the 2018 Wyoming Proposed RMPA/Final EIS), the wildlife/special status species standards are emphasized. As Greater Sage-Grouse habitat would continue to be considered at the implementation level with site-specific analysis, following management prescriptions analyzed in the 2014 and 2015 Final EISs, no additive impact of this change is anticipated.

Adaptive Management, Mitigation, and Prioritization of Leasing

Similarly, no appreciable additive impacts are anticipated from Wyoming establishing a process whereby adaptive management actions are reviewed and reversed once the identified causal factor is resolved. This process would ensure that the BLM is utilizing the best available science and decision support tools to guide management at the appropriate spatial scale, thus improving the BLM's assessment and response to ever-changing conditions that could affect Greater Sage-Grouse populations and habitat. It would ensure that once causal factors are resolved, management reverts to pre-adaptive management actions. Because any specific response to tripping a hard or soft trigger would be based on the causal factors responsible, presuming a specific response to unknown future conditions would be speculative at best and not reasonably foreseeable. As Montana is not proposing to change any part of its adaptive management process, and Wyoming did not identify any additional direct or indirect impacts as a result of this proposed change, there are no additional cumulative impacts associated with the proposed changes to adaptive management implementation.

Under the Proposed Plan Amendment in Wyoming, language would be added to clarify how implementation-level decisions would be guided regarding mitigation and prioritization of fluid mineral leasing to better align with state conservation plans and management strategies. As identified in the direct and indirect effects section of this SEIS, impacts on Greater Sage-Grouse would be minor as a result of these changes and could include localized detrimental impacts in some areas and beneficial impacts in others, but they would not affect Greater Sage-Grouse conservation. As a result, there would be no appreciable additive impact from the implementation of these clarifications on Greater Sage-Grouse habitat or populations across MZ I.

The BLM's Proposed Plan Amendments in MZ I are also unlikely to preclude the reasonably foreseeable actions listed in **Appendix H** from proceeding. Some small, localized populations may be at continued risk due to reasonably foreseeable infrastructure and energy development projects over the next 20 years, when combined with unplanned events such as wildfires, drought, and an associated decline in Greater Sage-Grouse habitat quality; however, the Proposed Plan Amendments retain conservation measures that would be applied consistent with State management plans. They would continue proactive habitat restoration efforts being completed by private, local, state, and federal partners across the MZs, to adequately conserve and manage Greater Sage-Grouse habitat.

4.13.4 Cumulative Effects on Greater Sage-Grouse: Management Zone II/VII

In addition to the analysis in the 2015 Final EIS in Table 4-4, other anticipated incremental impacts are discussed below in association with planning issues being analyzed in this SEIS.

MZ II/VII encompasses portions of Wyoming, Colorado, Utah, Montana, and Idaho. Under the Proposed Plan Amendments in this MZ, PHMA would decrease by 1 percent and GHMA would decrease by 1 percent, compared to the acreage values in the No-Action Alternative. The proposed change in HMA

acres reflects changes in Utah, where PHMA would be reduced by approximately 35,000 acres and GHMA (826,000 acres) would be removed in an effort to align with the Sage-Grouse Management Areas identified by the State of Utah. In Idaho, approximately 50,000 acres would change from PHMA to Important Habitat Management Area (IHMA) for population monitoring purposes as a result of a tripped adaptive management trigger; however, the habitat would continue to be managed as PHMA, which results in no net change to overall acreages included in the HMAs. Across this MZ, no other modifications to HMAs are currently proposed. Montana is currently not undergoing a plan amendment process; therefore, none of the proposed changes described in this section apply to Greater Sage-Grouse in Montana.

In Colorado, in the No-Action Alternative, PHMA within 1 mile of active leks is closed to leasing. The Proposed Plan Amendment would open PHMA within 1 mile of active leks to leasing, subject to NSO stipulations with restrictive criteria for waivers, exceptions, and modifications. Although this allocation change would make additional acres available to leasing, the impact on Greater Sage-Grouse and its habitat is likely to be minimal because surface disturbance, fragmentation, and indirect habitat loss would not be expected to increase due to restrictions on surface disturbance. Additionally, better coordination with the State provides more of an all-lands approach that, due to multiple jurisdictions with regulatory authority over land and mineral ownership, may result in better landscape-scale protections for Greater Sage-Grouse and its habitat.

For the remainder of the planning areas within MZ II and VII, RMP allocations tied to HMAs did not change between the No-Action and the Proposed Plan Amendment.

The decrease in PHMA and GHMA as a result of better alignment with the State of Utah's Greater Sage-Grouse management plan between the No-Action and the Proposed Plan Amendment would have negligible to minimal impacts on Greater Sage-Grouse and its habitat in the context of the entire MZ. The reduction of PHMA was associated with timbered mountains that do not include Greater Sage-Grouse habitat. The removal of GHMA in MZ II/VII effects populations where the BLM has very little decision space (surface or mineral estates) or areas with very small populations that are already heavily affected by existing oil and gas development resulting in infrastructure at a density above what science has indicated Greater Sage-Grouse need to persist. Additionally, the relevant distribution of land use plan allocations associated with these HMA changes would not significantly change (0-3 percent; see **Appendix H**).

The planning efforts being undertaken in this MZ would incorporate management flexibility in Colorado, Utah, and Idaho plans that would allow exceptions to allocation decisions similar to flexibility already in the Wyoming and Montana plans. These changes would allow for site-specific adjustments for land use authorizations based on site conditions. In addition, there would be adjustments to existing adaptive management strategies for all plans in this MZ. Within this MZ, all plans would remove the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872, and they would make slight adjustments to habitat objectives, and Colorado and Idaho plans would identify new exceptions to seasonal timing restrictions to provide for consideration of site-specific conditions already present in the Utah, Wyoming and Montana plans.

Despite these actions, cumulative impacts on Greater Sage-Grouse populations and habitat across MZs II/VII would be consistent with those impacts identified in the 2015 Final EISs for the then Proposed Plan Amendments. The currently Proposed Plan Amendments changes from the No-Action Alternative

would be minor. Disturbance from energy development, mining, and infrastructure, as well as the resulting habitat fragmentation, remain the greatest threat to Greater Sage-Grouse in the Rocky Mountain Region. Because the land use prescriptions within designated HMAs and the allocations associated with those HMAs are not being proposed for change in any plan in MZs II/VII, there would be no additional cumulative impacts on Greater Sage-Grouse across this MZ.

A summary of potential cumulative impacts by proposed management action is presented below.

Impacts on Greater Sage-Grouse as a result of surface disturbance would likely be greater where development and disturbance are more intense and in areas where development overlaps sensitive habitats. The degree of impact would depend on the timing of development activities and whether the amount of development activity and disruption outpaces successful reclamation and revegetation efforts in disturbed areas. Increased flexibility for updating HMAs across MZs II/VII would not result in any additive impacts on Greater Sage-Grouse and could result in beneficial impacts as a result of consistent management across the zone. Future modifications of HMAs would be documented using the appropriate level of NEPA analysis, if applicable, that would provide analysis regarding any potential impacts; however, because the underlying HMA allocations and the respective restrictions on those allocations put in place to conserve Greater Sage-Grouse would not change, and any proposed updates would reflect the most recent knowledge concerning Greater Sage-Grouse habitat utilization and distribution, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse habitat or population.

The allocation exception process would be updated in Colorado, Utah, and Idaho to simplify the various exemptions contained in the 2015 Final EIS. While the availability of exceptions to land use plan allocations attached to PHMA and GHMA could increase the possibility of leasing, permitting, or ground-disturbing activities within a given HMA, the established criteria would ensure that projects are either in unsuitable Greater Sage-Grouse habitat; do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse; benefit Greater Sage-Grouse or its habitat; or can be offset, with the exception of those needed for public health and safety. There would be no appreciable additive impact, therefore, from the implementation of this action on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

In MZ II/VII, approximately 216,000 acres of PHMA in Wyoming and 164,000 acres of PHMA in Utah were recommended for withdrawal from location and entry under the 1872 Mining Law in the current RMPs. This recommendation, if implemented through a future separate withdrawal action supported by its own NEPA analysis, would apply to approximately 3 percent of the MZ. The proposed change to the withdrawal recommendation itself would not have any on-the-ground effects; the conservation benefits of a future withdrawal would be minimal, as documented in the 2016 SFA Draft EIS and as explained above.

Approximately 99 percent of GHMA and PHMA in MZ II/VII is open to livestock grazing; this is not proposed for change in any states' Proposed Plan Amendments; therefore, no additional cumulative impacts beyond those identified in the 2015 Final EISs are anticipated. In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. Improper livestock grazing could cause changes in habitat. Changes in plant composition could occur in varying degrees and could change the vegetation structure, affecting cover for nesting birds; however, proper

grazing can be used to reduce fuel loads and reduce the risk of wildfire and can also be managed to reduce the spread of invasive grasses. Specific impacts on Greater Sage-Grouse habitat from livestock grazing are incorporated by reference from the 2015 Final EIS. All ongoing planning efforts in MZ II/VII would make slight adjustments to habitat objectives. In Wyoming and Utah, they would provide for more flexibility for making site-specific adjustments to livestock grazing management if the site-specific monitoring indicated adjustments were necessary.

Under the Proposed Plan Amendments, language would be added to clarify how some implementation level decisions, including mitigation, prioritization of fluid mineral leasing, disturbance caps, and clarification of required design features would be guided to better align with state conservation plans and management strategies. As identified in the direct and indirect effects section of this SEIS, impacts on Greater Sage-Grouse would be minor as a result of these changes and could include localized detrimental impacts in some areas and beneficial impacts in others, but would not cumulatively compromise Greater Sage-Grouse conservation efforts throughout the individual states. As a result, there would be no appreciable additive impact from the implementation of these clarifications on Greater Sage-Grouse habitat or populations across this MZ.

Similarly, no appreciable additive impacts are anticipated from updating the adaptive management process as described in the Proposed Plan Amendments. In Wyoming and Utah, this process would be updated at the implementation level to ensure that adaptive management actions are reviewed and reversed once the identified causal factor is resolved. In all states in this MZ, this update would ensure that the BLM is using the best available science and decision support tools to guide management at the appropriate spatial scale, thus improving the BLM's assessment and response to ever-changing conditions that could affect Greater Sage-Grouse populations and/or habitat. Because any specific response to tripping a hard or soft trigger would be based on the causal factors responsible, presuming a specific response to unknown future conditions would be speculative and not reasonably foreseeable.

In Idaho, removal of the project disturbance cap would not result in any changes to allocation decisions; rather, it would allow the BLM to cluster development in PHMA and IHMA only after meeting the anthropogenic disturbance screening criteria and the disturbance development criteria. Lek buffer modifications would also not result in any allocation changes. Some lek buffers would be increased as a result of the Proposed Plan Amendment, but, in some cases, the lek buffers may be smaller than those identified in the No-Action Alternative. The existing disturbance screening criteria and the disturbance development criteria, however, would highly restrict development activities in both PHMA and IHMA; therefore, the changes in lek buffer sizes would have no additive effect.

The BLM's Proposed Plan Amendments in MZ II/VII are also unlikely to preclude the reasonably foreseeable actions listed in **Appendix H** from proceeding. Some small, localized populations may be at continued risk due to reasonably foreseeable infrastructure and energy development projects over the next 20 years, when combined with unplanned events such as wildfire, drought, and an associated decline in Greater Sage-Grouse habitat quality. The Proposed Plan Amendments, however, retain conservation measures that would be applied consistent with State management plans. They continue proactive habitat restoration efforts being completed by private, local, state, and federal partners across the MZ, to adequately conserve and maintain Greater Sage-Grouse habitat.

The Rawlins Field Office in Wyoming approved a RMP Amendment for Visual Resource Management and the expansion of the Blowout Penstemon Area of Critical Environmental Concern (ACEC) during

this Greater Sage-Grouse planning effort (BLM 2018c). The visual resource management decisions are implementation level decisions which would be applied on a project-specific basis and do not represent changes in allocations, thus would not have cumulative impacts for Greater Sage-Grouse in MZ II. The Blowout Penstemon ACEC has been expanded from approximately 17,000 acres to 29,000 acres (an increase of approximately 12,000 acres) and was originally established in the 2008 Rawlins RMP to protect the endangered blowout penstemon (*Penstemon haydenii*). The expanded ACEC is closed to new oil and gas leasing and is an exclusion area for wind energy development, as well as being closed to mineral material disposals. These management decisions are the only changes in allocations and would only impact a small portion of the Rawlins Field Office and MZ II. A small portion of the ACEC overlaps with Greater Sage-Grouse PHMA and these more restrictive land uses in the ACEC would serve to further protect Greater Sage-Grouse PHMA. There would be no additional cumulative impacts on Greater Sage-Grouse in MZ II as a result of the Rawlins RMP Amendment.

4.13.5 Cumulative Effects on Greater Sage-Grouse: Management Zone III

In addition to the analysis in the 2015 Final EIS in Table 4-4, other anticipated incremental impacts are discussed below in association with planning issues being analyzed in this SEIS.

This area encompasses portions of California, Nevada, and Utah. Under the Proposed Plan Amendments in Nevada, northeastern California, and Utah, PHMA would decrease by 1 percent, GHMA would decrease by 2 percent, and for Nevada and northeastern California only, OHMA would decrease by 2 percent, as compared to the acreages identified in the No-Action Alternative. The proposed change in HMA acres between the No-Action and the Proposed Plan Amendment in Nevada and northeastern California is based on adjustments made to habitat modeling used to delineate HMAs and improve alignment with the State of Nevada's delineations for HMAs, which the State of Nevada adopted in December 2015. In Utah, GHMA (approximately 860,000 acres) were removed in the Proposed Plan Amendment in an effort to align with the HMAs identified by the State of Utah. Following this HMA modification, planning-level allocation decisions have also been adjusted in the Proposed Plan Amendment to reflect the distribution of HMA in the Nevada and Northeastern California Sub-region.

In both planning areas within this MZ, land use plan allocations tied to HMAs did not change between the alternatives. The decrease in PHMA, GHMA, and OHMA within MZ III between the No-Action Alternative and the Proposed Plan Amendment would therefore have negligible to minimal impacts on Greater Sage-Grouse and its habitat in the context of the entire MZ. This is because the relevant distribution of land use plan allocations associated with these HMAs is not significantly changing (0-3 percent decrease; see **Appendix H**).

Both planning efforts' Proposed Plan Amendments in MZ III incorporate management flexibility that would allow exceptions to allocation decisions within PHMA, GHMA, and OHMA in Nevada and northeastern California. In both planning areas, it would allow for site specific adjustments for land use authorizations and adjustments to existing adaptive management strategies. Under both sets of Proposed Plan Amendments, the BLM would remove the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872, make adjustments to habitat objectives, and identify exceptions or modifications to seasonal timing restrictions. The cumulative impacts of these proposed changes to Greater Sage-Grouse populations across MZ III would be consistent with the cumulative impacts analyzed and disclosed in the 2015 Final EISs. Moreover, these proposed changes, which focus on anthropogenic disturbances, would have only a minor or limited effect on efforts to manage and

conserve Greater Sage-Grouse in this MZ, where wildfire, invasive plants, and conifer encroachment are the greatest threats to the Greater Sage-Grouse and its habitat.

The BLM's Proposed Plan Amendments in MZ III are also unlikely to preclude the reasonably foreseeable actions listed in **Appendix H** from proceeding. Some small, localized populations may be at continued risk due to the reasonably foreseeable future infrastructure and energy development projects over the next 20 years, when combined with unplanned events such as wildfires, drought, and an associated decline in Greater Sage-Grouse habitat quality. The Proposed Plan Amendments, however, retain conservation measures in combination with continued proactive habitat restoration efforts being completed by private, local, state, and federal partners across the MZ to adequately conserve and maintain Greater Sage-Grouse habitat.

A summary of potential cumulative impacts by proposed management action is presented below.

Under the Management Alignment Alternative and Proposed Plan Amendment, HMA boundaries in Nevada and northeastern California would be adopted or revised to incorporate the best available science (Coates et al. 2016). Because the underlying HMA allocations put in place to conserve Greater Sage-Grouse would not change, and these updates reflect the most recent knowledge concerning Greater Sage-Grouse habitat utilization and distribution, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse or the resources/uses analyzed herein.

Similarly, no appreciable additive impacts are anticipated from updating the adaptive management process as described in the Management Alignment Alternative and Proposed Plan Amendment. This update would ensure that the BLM is utilizing the best available science and decision support tools to guide management at the appropriate spatial scale, thus improving the BLM's assessment and response to ever-changing conditions that could affect Greater Sage-Grouse populations and habitat. Because any specific response to tripping a hard or soft trigger would be based on the causal factors responsible, presuming a specific response to unknown future conditions would be speculative at best and not reasonably foreseeable.

Under the Management Alignment Alternative and Proposed Plan Amendment, the allocation exception process would be updated to simplify the various exemptions contained in the 2015 Final EIS. While the availability of exceptions to land use plan allocations attached to PHMA and GHMA could increase the possibility of leasing, permitting, or ground-disturbing activities within a given HMA, the established criteria would ensure that projects are either in unsuitable Greater Sage-Grouse habitat; do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse; or can be offset, with the exception of those needed for public health and safety. There would be no appreciable additive impact, therefore, from the implementation of this action on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

Under the Management Alignment Alternative and Proposed Plan Amendment, language would be added to clarify how implementation level decisions would be guided regarding mitigation, seasonal timing restrictions, and modifying habitat objectives to better align with state conservation plans and management strategies. As these updates did not result in any new identifiable direct or indirect impacts, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

4.13.6 Cumulative Effects on Greater Sage-Grouse: Management Zone IV

In addition to the analysis in the 2015 Final EIS in Table 4-4, other anticipated incremental impacts are discussed below in association with planning issues being analyzed in this SEIS.

MZ IV encompasses portions of Idaho, Nevada, Montana, Oregon, Utah, and a small portion of Wyoming. Under the Proposed Plan Amendment PHMA would decrease by 2 percent, IHMA would decrease by 0 percent, GHMA would decrease by 0 percent, and OHMA would decrease by 1 percent, as compared with the acreage identified in the No-Action Alternative. The proposed changes in HMA acres between the No-Action Alternative and the Proposed Plan Amendment in Nevada and Northeastern California Sub-region is based on adjustments made to habitat modeling used to delineate HMA and to improve alignment with the State of Nevada's delineations for HMA. In Idaho, minor proposed changes in HMAs are based on cleaning up habitat mapping errors, removing non-Greater Sage-Grouse habitat that is being managed as PHMA as a result of SFA designation in the 2015 Final EIS, and reallocating an area of PHMA to IHMA because there was no historic lek routes in the PHMA polygon. This made it impossible to apply the adaptive management framework in that polygon. HMA are not proposed to change in Wyoming, Utah, or Oregon in MZ IV.

The direct and indirect effects of proposed management changes in the Wyoming, Idaho, Utah, Nevada, California and Oregon Proposed Plan Amendments are disclosed in each state's Proposed RMPA/Final EISs. Change in allocation decisions is a better indicator to determine how changes across a MZ would affect Greater Sage-grouse populations; therefore, this cumulative effects analysis relied on changes in planning allocations as the metric to measure cumulative effects in MZ IV. See **Appendix H** for a description of MZ IV. Idaho comprises 50 percent of the MZ while Wyoming only comprises 0.3 percent.

In all planning areas within MZ IV, land use plan allocations tied to HMA would not change between the No-Action and Proposed Plan Amendment. The decrease in PHMA, GHMA, and OHMA within MZ IV between the No-Action Alternative and the Proposed Plan Amendment would therefore have negligible to minimal impacts on Greater Sage-Grouse and its habitat in the context of the entire MZ, as the relevant distribution of land use plan allocations associated with these HMAs is not significantly changing (0-2 percent, see **Appendix H**).

Each planning efforts' Proposed Plan Amendment in MZ IV incorporate management flexibility that would allow exceptions to allocation decisions within HMA and would allow for site specific adjustments for land use authorizations and adjustments to existing adaptive management strategies. Under all Proposed Plan Amendments, the BLM would remove the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872, make adjustments to habitat objectives, and identify new exceptions to seasonal timing restrictions. The cumulative impacts of these proposed changes on Greater Sage-Grouse populations across MZ IV would be consistent with cumulative impacts described in the 2015 Final EIS. Moreover, these proposed changes, which focus on anthropogenic disturbances, would have only a minor or limited effect on efforts to manage and conserve Greater Sage-Grouse in this MZ, where wildfire, invasive plants, and conifer encroachment are greater threats to the Greater Sage-Grouse and its habitats.

The BLM's Proposed Plan Amendments in the MZ are also unlikely to preclude the reasonably foreseeable actions listed in **Appendix H** from proceeding. Some small, localized populations may be at

continued risk due to reasonably foreseeable future infrastructure and energy development projects over the next 20 years, when combined with unplanned events such as wildfires, drought, and associated decline in Greater Sage-Grouse habitat quality; however, the Proposed Plan Amendments retain conservation measures in combination with continued proactive habitat restoration efforts being completed by private, local, state, and federal partners across the MZ to adequately conserve and manage Greater Sage-Grouse habitats.

A summary of potential cumulative impacts by proposed management action is presented below.

The proposed plans vary from state to state as does each state contribution to MZ IV. Montana is not engaging in an amendment process therefore they would not be contributing to any cumulative effects. Wyoming has approximately 4,000 acres of PHMA and 20,000 Acres of GHMA within MZ IV making their potential contribution to cumulative effects within the 80 million acre MZ IV negligible.

The portion of Utah that is within MZ IV is an isolated area with little or no development potential for fluid minerals and is predominantly used for livestock grazing. The reasonably foreseeable development scenario for the area predicts zero wells. The changes proposed in Utah's proposed plan would have no additive effect on Greater Sage-Grouse habitats within MZ IV.

The Oregon RMPA would change access on 21,959 acres in all or portions of key Research Natural Areas (RNAs) from unavailable to grazing to available for grazing. No other States within MZ IV are proposing changes to grazing allocation decisions. This change would not add measurably to other actions occurring within the approximately 80 million acres in MZ IV.

The area of MZ IV that includes Utah is extremely isolated. The dominant use is grazing. Grazing management would follow rangeland health. Changes to Utah's **Table 2-2** that incorporate local science would benefit Greater Sage-Grouse and ensure that grazing management is conducted properly and would not add cumulatively to Greater Sage-Grouse effects. The area continues to be a ROW avoidance area and is closed to wind energy development. The reasonably foreseeable development scenario for the area predicts zero wells so the change to limited exceptions waivers and modifications are moot. The changes proposed in Utah's proposed plan would not add measurably to other actions occurring within the approximately 80 million acres in MZ IV.

Nevada and Northeastern California's proposed plan would revise the habitat management area boundaries to incorporate the best available science (Coates et al. 2016), but would not change the allocations associated with each HMA. Nevada and Northeastern California would also update its adaptive management process to ensure that the BLM is utilizing the best available science and decision support tools to guide management at the appropriate spatial scale. These changes would not be measurably different compared to other actions occurring in MZ IV.

In Idaho, removal of the project disturbance cap would not result in any changes to allocation decisions; rather, it would allow the BLM to cluster development in PHMA and IHMA only after meeting the anthropogenic disturbance screening criteria and the disturbance development criteria. Lek buffer modifications would also not result in any allocation changes. Some lek buffers would be increased as a result of the Proposed Plan Amendment, but, in some cases, the lek buffers may be smaller than those identified in the No-Action Alternative. The existing disturbance screening criteria and the disturbance

development criteria, however, would ensure that impacts from development activities in both PHMA and IHMA would not result in a net loss to Greater Sage-Grouse habitat.

Within MZ IV, Oregon would retain its SFA designations while Idaho and Nevada would remove SFA designations. Under the proposed plan in Idaho and Nevada, the NSO stipulation without waivers, exceptions and modifications would change to NSO with limited exceptions. The exception criteria could ensure that projects are either in unsuitable Greater Sage-Grouse habitat; do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse; or can be offset, with the exception of those needed for public health and safety. There would be no appreciable additive impact, therefore, from the implementation of this action on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

Under the proposed plan, language would be added to clarify how implementation level decisions would be guided regarding mitigation, seasonal timing restrictions, and modifying habitat objectives to better align with state conservation plans and management strategies. As these updates did not result in any new identifiable direct or indirect impacts, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

4.13.7 Cumulative Effects on Greater Sage-Grouse: Management Zone V

In addition to the analysis in the 2015 Final EIS in Table 4-4, other anticipated incremental impacts are discussed below in association with planning issues being analyzed in this SEIS.

MZ IV encompasses portions of California, Oregon and Nevada. All proposed changes to HMAs and recommended SFAs for withdrawal within this MZ occur in Nevada and northeastern California. The Oregon amendment did not propose any changes in the extent of PHMA or GHMA. Oregon removed the recommendation for a withdrawal of SFA under a plan maintenance action in May 2018, prior to the start of the 2019 planning process. That action resulted in no difference between No-Action and Management Alignment Alternatives and the Proposed Plan Amendment in terms of withdrawals.

Under the Proposed Plan Amendment in Nevada and northeastern California, PHMA would decrease by 1 percent, GHMA would decrease by 2 percent, and for Nevada and northeastern California only, OHMA would decrease by 2 percent, as compared with the acreages identified in the No-Action Alternative. The proposed change in HMA acres between the No-Action Alternative and the Proposed Plan Amendment in Nevada and northeastern California is based on adjustments made to habitat modeling used to delineate HMA and improve alignment with the State of Nevada's delineations for HMA, which the State of Nevada adopted in December 2015. Following this HMA modification, planning level allocation decisions have also been adjusted to reflect the distribution of habitat in Nevada and Northeastern California Sub-region. Future adjustments to HMA in Nevada and Northeastern California would be based on best available science and to align with the respective states' delineations for Greater Sage-Grouse habitat.

In Oregon, the only proposed decision under the Management Alignment Alternative and Proposed Plan Amendment would retain livestock grazing within key Research Natural Areas. The Management Alignment Alternative and Proposed Plan Amendment would result in allowing livestock grazing on 21,959 acres within the Oregon planning area. In the context of the entire MZ, this change would have

negligible to no effects on Greater Sage-Grouse populations. Well-managed grazing practices are compatible with sagebrush ecosystems and Greater Sage-Grouse persistence.

A summary of potential cumulative impacts by proposed management action is presented below.

Under the Nevada and northeastern California Proposed Plan Amendment, the Management Alignment Alternative and Proposed Plan Amendment would increase PHMA by less than 1 percent, decrease GHMA by 1 percent and decrease OHMA by 2 percent. This change in HMA acres between the No-Action and Management Alignment Alternative and Proposed Plan Amendment would be the result of improved habitat modeling used to delineate HMAs using the best available science and to align with the State of Nevada's delineations for HMA (adopted by the State of Nevada in December 2015). Following this HMA modification, planning level allocation decisions have also been adjusted to reflect the distribution of habitat in Nevada and northeastern California.

The Management Alignment Alternative and Proposed Plan Amendment for the Nevada and Northeastern California Sub-region would also remove the recommendation for a withdrawal in the SFA; allow exceptions to allocation decisions within PHMA, GHMA, and OHMA; modify the existing adaptive management strategy; make adjustments to habitat objectives; and identify exceptions to seasonal timing restrictions. Removing the recommendation to withdraw SFAs from location and entry under the Mining Law of 1872 would result in a 3 percent decrease of acres recommended for withdrawal (see **Appendix H**). The largest percent allocation change between the alternatives within the MZ would be consistent with those impacts described in the 2015 Final EIS for the then Proposed Plan Amendments because the Management Alignment Alternatives and Proposed Plan Amendment changes from the No-Action Alternative are minor and deal largely with anthropogenic disturbances. The greatest threats to populations in this MZ would remain wildfire, invasive plants, and conifer encroachment.

The decreases in GHMA and OHMA within MZ V between the No-Action Alternative and Management Alignment Alternative and Proposed Plan Amendment would therefore have negligible to no effect on Greater Sage-Grouse populations and their habitat in the context of the entire MZ, as the relevant distribution of land use plan allocations associated with these HMAs would result in an estimated 2.5 to 3 percent decrease, all within Nevada and northeastern California (see **Appendix H**).

The BLM's Proposed Plan Amendments in MZ V are unlikely to preclude the reasonably foreseeable actions listed in **Appendix H** from proceeding. Overall, the Proposed Plan Amendments retain conservation measures in combination with continued proactive habitat restoration efforts being completed by private, local, state, and federal partners across the MZ; however, smaller populations, particularly those at the edge of the species range, would remain at highest risk of extirpation (Aldridge et al. 2008; Garton et al. 2011), which the reasonably foreseeable actions may exacerbate as unplanned events such as wildfire, drought, and other natural disturbances lead to declines in Greater Sage-Grouse habitat quality.

Under the Management Alignment Alternative and Proposed Plan Amendment, HMA boundaries in the Nevada and Northeastern California Sub-region would be adopted or revised to incorporate the best available science (Coates et al. 2016). Because the underlying HMA allocations put in place to conserve Greater Sage-Grouse would not change, and these updates reflect the most recent knowledge

concerning Greater Sage-Grouse habitat use and distribution, there would be no appreciable additive impact from the implementation of this aspect on Greater Sage-Grouse or the resources/uses analyzed herein.

Similarly, no appreciable additive impacts are anticipated from updating the adaptive management process as described in the Management Alignment Alternative and Proposed Plan Amendment. This update would ensure that the BLM is utilizing the best available science and decision support tools to guide management at the appropriate spatial scale, thus improving the BLM's assessment and response to ever-changing conditions that could affect Greater Sage-Grouse populations and habitat. Because any specific response to tripping a hard or soft trigger would be based on the causal factors responsible, presuming a specific response to unknown future conditions would be speculative at best and not reasonably foreseeable.

Under the Management Alignment Alternative and Proposed Plan Amendment, the allocation exception process would be updated to simplify the various exemptions contained in the 2015 Final EIS. While the availability of exceptions to land use plan allocations attached to PHMA and GHMA could increase the possibility of leasing, permitting, or ground-disturbing activities within a given HMA, the established criteria would ensure that projects are either in unsuitable Greater Sage-Grouse habitat; do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse; or can be offset, with the exception of those needed for public health and safety. There would be no appreciable additive impact from the implementation of this action on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

Under the Management Alignment Alternative and Proposed Plan Amendment, language would be added to clarify how implementation-level decisions would be guided regarding mitigation, seasonal timing restrictions, and modifying habitat objectives to better align with state conservation plans and management strategies. As these updates did not result in any new identifiable direct or indirect impacts, there would be no appreciable additive impacts from the implementation of this aspect on Greater Sage-Grouse or the resources/uses analyzed herein, as compared with the No-Action Alternative.

4.14 Irreversible and Irretrievable Commitment of Resources

Section 102(2)(C) of NEPA requires a discussion of any irreversible or irretrievable commitments of resources from an alternative, should it be implemented. An irreversible commitment of a resource is one that cannot be reversed, such as the extinction of a species or loss of a cultural resource site without proper documentation. An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time, such as extraction of oil and gas. Should oil and gas deposits underlying Greater Sage-Grouse habitat be extracted, that oil and gas resource would be lost.

4.15 Unavoidable Adverse Impacts

Section 102(C) of the NEPA requires disclosure of any adverse environmental impacts that could not be avoided should the proposal be implemented. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures, or impacts for which there are no mitigation measures. Some unavoidable adverse impacts may occur from implementing this SEIS; others are a result of public use of BLM-administered lands in the planning area.

This section summarizes major unavoidable impacts discussions of the impacts of each management action (in the discussion of alternatives) and provides greater information on specific unavoidable impacts.

Surface-disturbing activities could result in unavoidable adverse impacts. Although these impacts would be mitigated to the extent possible, unavoidable impacts would be inevitable under both the No-Action and Management Alignment alternatives and the Proposed Plan Amendment.

Impacts from permanent conversion of areas to other uses, such as transportation and mineral and energy development or off-highway vehicle use, would be greater under the Management Alignment Alternative and Proposed Plan Amendment, but overall minimal for both alternatives. The No-Action and Management Alignment Alternatives and the Proposed Plan Amendment would place restrictions on many types of development, which would most likely result in fewer visual intrusions and fewer instances of unavoidable wildlife habitat loss.

Wildlife, livestock, wild horses and burros, and other herbivores consume vegetation and affect soils through hoof action and possible compaction. When these impacts are kept at appropriate levels, natural processes such as plant growth and recovery, freeze-thaw periods, and microbial activity in the soil surface result in the recovery from these impacts and maintain site stability and health. Vegetation treatments promoting recovery of Greater Sage-Grouse habitats would result in the destruction of the target species, be it annual grass, noxious weed, or encroachment of juniper. Some level of competition for forage between wildlife, livestock, and wild horses would occur. Instances of displacement, harassment, and injury to these species could also occur. The No-Action and Management Alignment Alternatives and the Proposed Plan Amendment would place restrictions on development and surface-disturbing activities, which would minimize the likelihood of displacement, harassment, and/or injury.

Development of mineral resources and general use of the decision area would introduce additional ignition sources into the planning area, which would increase the probability of wildland fire and the need for its suppression. These activities, combined with continued fire suppression, would also affect the overall composition and structure of vegetation communities; this could increase the potential for high-intensity wildland fires. Restrictions on development under both alternatives would be expected to decrease the potential for ignitions in the decision area; however, impacts would be greater under the No-Action Alternative.

Numerous land use restrictions imposed throughout the decision area to protect Greater Sage-Grouse habitat and other important values, by their nature, affect the ability of operators, individuals, and groups who use the public lands to do so without limitations. Although attempts would be made to minimize these impacts, unavoidable adverse impacts could occur under the No-Action and Management Alignment Alternatives and the Proposed Plan Amendment.

4.16 Relationship Between Local Short-Term Uses and Long-Term Productivity

Section 102(C) of NEPA requires a discussion of the relationship between local, short-term uses of human environment and the maintenance and enhancement of long-term productivity of resources. As described in the introduction to this chapter, short-term is defined as anticipated to occur within the

first 5 years of implementation of the activity and long-term as lasting beyond 5 years to the end of or beyond the life of this SEIS.

Surface-disturbing activities, including transportation and utility corridor construction, and mineral resource development would result in the greatest potential for impacts on long-term productivity. Management prescriptions and required design features (RDFs) are intended to minimize the effect of short-term commitments and to reverse changes over the long-term. These prescriptions and the associated reduction of impacts would be greater under the No-Action Alternative for resources such as vegetation and wildlife habitat; however, some impacts on long-term productivity might occur, despite the prescriptions intended to reduce impacts on Greater Sage-Grouse and its habitat.

Rights of ways (ROWs) and short-term use of an area to foster energy and mineral development would result in long-term loss of soil productivity and vegetation diversity. Impacts would persist as long as surface disturbance and vegetation loss continue. In general, the loss of soil productivity would be directly at the point of disturbance; even so, long-term vegetation diversity and habitat value could be reduced due to fragmentation and the increased potential for invasive species to spread from the developments or disturbances. The No-Action and Management Alignment Alternatives and the Proposed Plan Amendment would provide for long-term productivity through restrictive allocations that limit development in many areas and through the application of other restrictions on development, such as disturbance caps, RDFs, and other management prescriptions.

ROWs and the short-term use of Greater Sage-Grouse habitat for energy and mineral development could impair the long-term productivity of Greater Sage-Grouse and its habitat and that of other species. This could occur by displacing the species from primary habitats and removing components of these habitats that might not be restored for 20 years or longer. These short-term uses could also affect the long-term sustainability of some special status species. The potential for these impacts, however, would be minimal under the No-Action and Management Alignment Alternatives and the Proposed Plan Amendment. The short-term resource uses associated with mineral development (oil and gas seismic exploration, natural gas test well drilling, and the noise associated with these activities) would have adverse impacts on the long-term productivity of Greater Sage-Grouse and its habitat. This would be the case if these resource uses were to infringe on Greater Sage-Grouse seasonal habitats such as lekking, nesting, brood-rearing, and winter habitats. These activities, though short term individually, could have collective long-term impacts on Greater Sage-Grouse and its habitat if they were to increase in the long-term.

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Chapter 5. Consultation and Coordination

5.1 Public Involvement During the 2019 NEPA Process

5.1.1 Public Comments on the 2019 DSEIS

BLM will accept comments on this DSEIS for 45 days after the NOA publishes in the *Federal Register*.

5.1.2 Future Opportunities for Public Involvement on the SFEIS

After receiving comments on the DSEIS, and making any appropriate updates, the BLM will publish a Notice of Availability in the *Federal Register* to notify the public of the availability of the SFEIS.

5.2 American Indian Tribal Consultation

Various federal laws require the BLM to consult with American Indian tribes during the NEPA process. This section documents the specific consultation and coordination undertaken throughout the process of developing the 2018 Final EIS. No new consultation is being initiated because no new decisions are being considered as the DSEIS solely updates NEPA analysis to clarify the approach taken in the 2018 Final EIS.

In addition to formal government-to-government consultations, in the fall of 2017, the Nevada and California BLM mailed letters to the tribes listed below, inviting them to participate as a cooperating agency in the planning process.

- Pahrump Paiute Tribe
- Paiute-Shoshone Tribe of the Fallon Reservation and Colony, Nevada
- Pit River Tribe of California
- Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation, Nevada
- Reno-Sparks Indian Colony
- Shoshone-Paiute Tribes of the Duck Valley Reservation, Nevada
- Summit Lake Paiute Tribe
- Susanville Indian Rancheria
- Te-Moak Tribe of Western Shoshone Indians of Nevada
- Walker River Paiute Tribe of the Walker River Reservation, Nevada
- Washoe Tribe of Nevada and California
- Winnemucca Indian Colony of Nevada
- Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch, Nevada
- Yomba Shoshone Tribe of the Yomba Reservation, Nevada

The Duckwater Shoshone Tribe of the Duckwater Reservation, Walker River Paiute Tribe of the Walker River Reservation, and the Washoe Tribe of Nevada and California formally accepted the Nevada and California BLM's invitation to be cooperating agencies. The Washoe Tribe of Nevada and California executed a Memorandum of Understanding (MOU) with the Nevada and California BLM to be a cooperating agency and also attended and participated in the cooperating agency meeting held on March 21, 2018. On March 28, 2018, Nevada and California BLM followed up (via email) with those tribes that did not respond to the fall invitation to become cooperators.

5.3 LIST OF DSEIS PREPARERS

An interdisciplinary team of staff from the BLM, in collaboration with Environmental Management and Planning Solutions, Inc. prepared the DSEIS.

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Glossary

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

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

Anthropogenic Disturbance. The direct loss or fragmentation of habitat due to human development and increased human activity causing the displacement of individuals through avoidance behavior (Holloran 2005).

Avoidance/Avoidance Area. These terms usually address mitigation of some activity (i.e., resource use). Paraphrasing the CEQ Regulations (40 CFR 1508.20), avoidance means to circumvent, or bypass, an impact altogether by not taking a certain action, or parts of an action. therefore, the term "avoidance" does not necessarily prohibit a proposed activity, but it may require the relocation of an action, or the total redesign of an action to eliminate any potential impacts resulting from it.

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

Biologically Significant Unit (BSU). A geographical/spatial area within Greater Sage-Grouse habitat that contains relevant and important habitats that are used as the basis for comparative calculations to support evaluation of changes to habitat and populations. For adaptive management (A**ppendix D**) BSUs are defined as nested lek clusters with similar climate and vegetation conditions.

Breeding Habitat. Habitats utilized by Greater Sage-Grouse for leks, pre-laying, nesting, and early brood-rearing.

Compensatory Mitigation. Compensating for the residual impacts by replacing or providing substitute resources or environments (40 CFR 1508.20).

Connectivity. The degree to which habitats for a species are continuous or interrupted across a spatial extent. Habitats defined as continuous are within a prescribed distance over which a species can successfully conduct key activities (e.g., effective dispersal distances of seeds or juveniles and mean distances moved for foraging, nesting, and brood-rearing). Habitats defined as interrupted are outside the prescribed distance (Wisdom et al. 2003).

Controlled Surface Used (CSU). CSU areas are open to fluid mineral leasing, but the stipulation allows the BLM to require special operational constraints, or the activity can be shifted more than 200 meters (656 feet) to protect the specified resource or value.

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

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

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

Decision Area. Public lands and mineral estate managed by the US Department of Interior, Bureau of Land Management that are within the planning area and are encompassed by all designated habitat.

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

Disturbance. Any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment (White and Pickett 1985). See also *Anthropogenic Disturbance.*

Early Brood-Rearing Habitat. Upland sagebrush sites relatively close to nest sites, typically characterized by high species richness, with an abundance of forbs and insects, where Greater Sage-Grouse hens raise chicks fewer than 21 days old (Connelly et al. 2000). Optimum early brood-rearing habitat consists of sagebrush stands and an herbaceous understory of grasses and forbs.

Ecological Site (ES). A conceptual division of the landscape that is defined as a distinctive kind of land, based on recurring soil, landform, geological, and climate characteristics. It differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and to respond similarly to management actions and natural disturbances (Caudle et al. 2013).

Ecological Site Descriptions (ESD). The documentation of the characteristics of an ecological site. It includes the data used to define the distinctive properties and characteristics of the ecological site; the biotic and abiotic characteristics that differentiate the site (i.e., climate, physiographic, and soil characteristics and plant communities); and the ecological dynamics of the site that describes how changes in disturbance processes and management can affect the site. An ESD also provides interpretations about the land uses and ecosystem services that a particular ecological site can support and management alternatives for achieving land management.

Ecological Site Potential. The plant community that can be supported in an area, given its edaphic[1] and climatic potential (Habich 2001).

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

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

General Habitat Management Area(s) (GHMA). An area that is likely to be occupied seasonally or year-round outside of a Priority Habitat Management Area and where management would apply to sustain the Greater Sage-Grouse populations. GHMA may include active leks, seasonal habitats, and fragmented or marginal habitat.

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

Habitat. An area with a combination of resources (such as space, food, cover, and water) and environmental conditions (such as temperature, precipitation, and the presence or absence of predators and competitors) that promotes occupancy by individuals of a given species and allows those individuals to survive and reproduce (Morrison et al. 1998).

Habitat Fragmentation. When connected natural areas are disjointed by habitat removal or converted to urban or agricultural land or physical barriers, such as fences and roadways, are constructed. Habitat fragmentation bisects the landscape and leaves smaller, more isolated land for wildlife, causing local and population level changes to native flora and fauna.

Habitat Management Area(s) (HMA). The spatial extent of Greater Sage-Grouse habitat management areas in Nevada and Northeastern California (specific to BLM-administered lands) in this RMPA; includes PHMA, GHMA, and Other Habitat Management Area(s) (OHMA).

Habitat Suitability. The relative appropriateness of a certain ecological area for meeting the life requirements of an organism (i.e., space, food, cover, and water). Categories of habitat suitability include suitable, marginal, potential, unsuitable, and non-habitat. Definitions of categories are included in this glossary (Stiver et al. 2015).

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

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

Landscape. A mosaic of landforms, vegetation, and land uses; a heterogeneous land area that is often hierarchically structured and varies in extent with the organisms being studied and the purpose for defining a landscape (Urban et al. 1987; Liu and Taylor 2002).

[1] Of, produced by, or influenced by the soil.

Late Brood-Rearing Habitat. Habitats characterized by succulent forbs next to or intermixed with sagebrush. Hens typically move their chicks to more mesic conditions, such as higher elevation sagebrush communities, wet meadow complexes, or agricultural fields. In general, a sagebrush ecosystem with a good understory of grasses and forbs and associated wet meadow areas, where succulent grasses and insects are available.

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

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

Lek. A traditional display area where two or more male Greater Sage-Grouse have attended in 2 or more of the previous 5 years. The area is typically in an open site in or next to sagebrush-dominated habitats (Connelly et al. 2003). Generally, lek sites are traditional, with the same lek sites used year after year (Scott 1942; Batterson and Morse 1948; Wiley 1978; Autenrieth 1981). Taller sagebrush on the outskirts of the leks is necessary as a food source, escape cover, nesting cover for females, and loafing cover during the day (Patterson 1952; Gill 1965; Klebenow 1985). Lek status as defined by the NDOW and CDFW as follows:

Active Lek—2 or more male observed at least twice in the last 5 years
Pending Lek—2 or more males observed only once in the last 5 years
Inactive—0 or 1 male observed during every visit (minimum two visits) in the last 5 years
Historic—0 or 1 male observed during every visit (minimum five visits) in the last 30 years

Lek Cluster. A group of leks in the same vicinity, among which Greater Sage-Grouse may interchange over time, and representing a group of closely related individuals.

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

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

Marginal Habitat. An area that supports the species but has generally lower survival rates and reproductive success by comparison and may or may not have the potential to become suitable in the future (Cooperrider et al. 1986).

Minimization Mitigation. Minimizing impacts by limiting the degree or magnitude of the action and its implementation (40 CFR 1508.20 [b]).

Mitigation. Includes specific means, measures or practices that could reduce, avoid, or eliminate adverse impacts. Mitigation can include avoiding the impact altogether by not taking a certain action or parts of an action, minimizing the impact by limiting the degree of magnitude of the action and its implementation, rectifying the impact by repairing, rehabilitation, or restoring the affected environment, reducing or eliminating the impact over time by preservation and maintenance operations during the life

of the action, and compensating for the impact by replacing or providing substitute resources or environments and have not been incorporated into a proposed action of an alternative (H-1790).

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

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

Non-habitat. An area in the historical distribution of Greater Sage-Grouse that is unoccupied, does not currently provide habitat, and does not have the potential to provide habitat in the foreseeable future (fewer than 100 years) (Stiver et al. 2015).

Other Habitat Management Area(s) (OHMA). Areas with appropriate environmental conditions for Greater Sage-Grouse that are less used by Greater Sage-Grouse or have marginal habitat suitability.

Planning Area. The geographical area for which resource management plans are developed and maintained regardless of jurisdiction.

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

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

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

Potential Habitat. An area that is currently unoccupied but has the potential for occupancy in the foreseeable future (fewer than 100 years) through succession or restoration (Stiver et al. 2015).

Priority Habitat Management Area(s) (PHMA). Areas that have been identified as having the highest conservation value to maintaining sustainable Greater Sage-Grouse populations. These areas are occupied seasonally or year-round and include breeding, late brood-rearing, and winter concentration areas.

Rectifying Mitigation. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (40 CFR 1508.20)

Reducing Mitigation. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (40 CFR 1508.20)

Resilience. Ability of a species or its habitat to recover from stresses and disturbances. Resilient ecosystems regain their fundamental structure, processes, and functioning when altered by stresses, such as increased carbon dioxide, nitrogen deposition, and drought, and to disturbances, such as land development and fire (Allen et al. 2005; Holling 1973).

Resistance. Capacity of an ecosystem to retain its fundamental structure, processes and functioning or to remain largely unchanged, despite stresses, disturbances, or invasive species (Folke et al. 2004).

Required Design Features (RDFs). Means, measures, or practices intended to reduce or avoid adverse environmental impacts. A suite of features that would establish the minimum specifications for certain activities (i.e., water developments, mineral development, and fire and fuels management) and mitigate adverse impacts. These design features would be required to provide a greater level of regulatory certainty than through implementation of best management practices. In general, the design features are accepted practices that are known to be effective when implemented properly at the project level.

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

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

State-and-Transition Model. A method to organize and communicate complex information about the relationships between vegetation, soil, animals, hydrology, disturbances (fire, lack of fire, grazing and browsing, drought, unusually wet periods, insects, and disease), and management actions on an ecological site (Caudle et al. 2013).

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

Stipulation (oil and gas). A provision that modifies standard oil and gas lease terms and conditions in order to protect other resource values or land uses and is attached to and made a part of the lease. Typical lease stipulations include no surface occupancy, timing limitations, and controlled surface use. Lease stipulations are developed through the land use planning process.

Suitable Habitat. An area that provides environmental conditions necessary for successful survival and reproduction to sustain stable populations (Cooperrider et al. 1986; Morrison et al. 1998).

Unsuitable Habitat. An area that does not currently provide one or more of the life requisites and therefore does not provide habitat but may provide habitat sometime in the foreseeable future (fewer than 100 years) through succession or restoration (Stiver et al. 2015).

Winter Habitat. Characterized by highly variable sagebrush canopy cover. In general, winter movements are related to severity of winter weather, topography, and vegetation cover. Consists of sagebrush that is at least 10 to 12 inches above snow level in order to provide both food and cover for wintering Greater Sage-Grouse.

Index

Appendix A

Maps

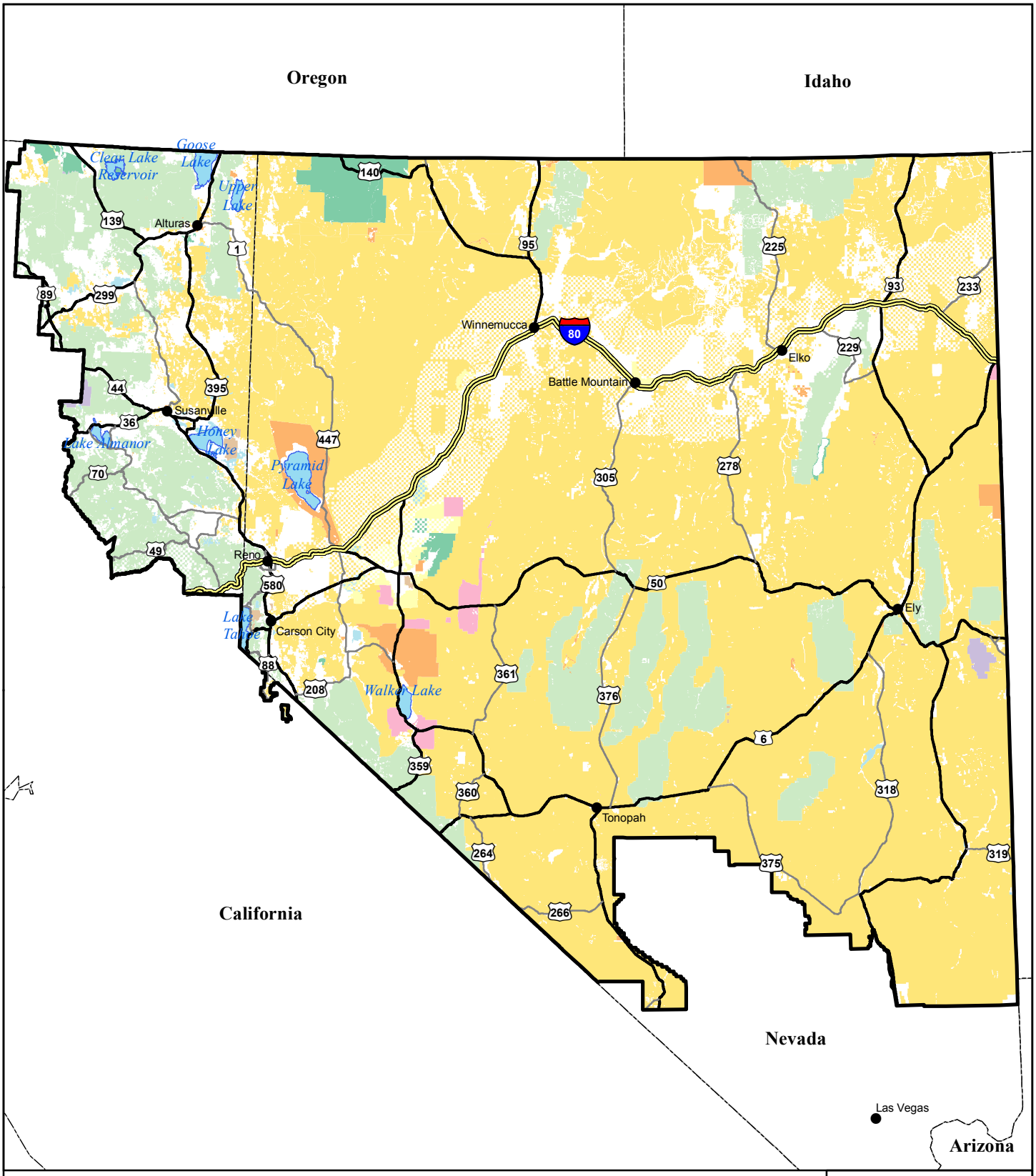


Figure 1-1: Nevada and Northeastern California Sub-Regional Planning Area, Surface Management

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

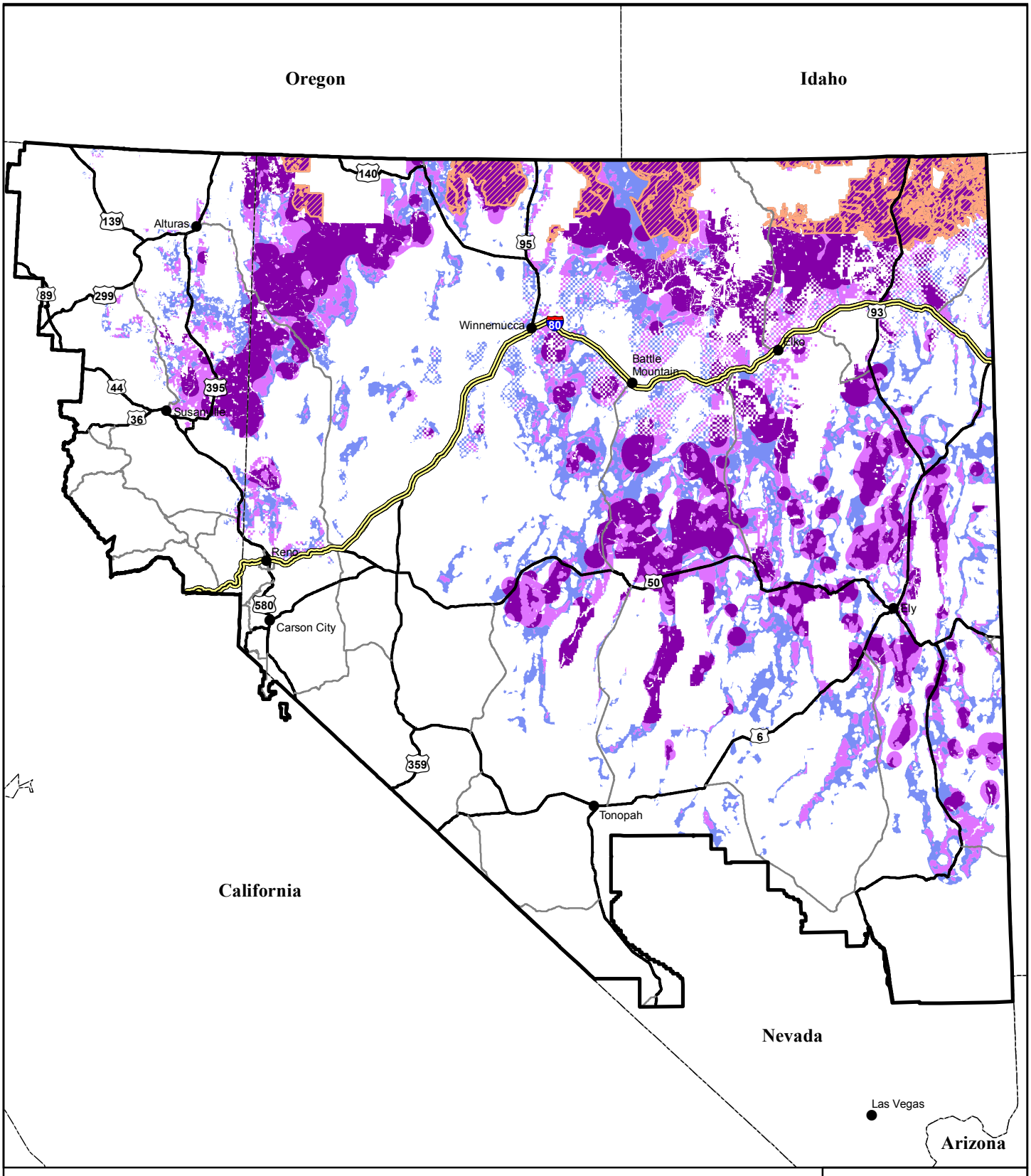


Figure 2-1a: Nevada and Northeastern California Habitat Management Areas on BLM Managed Public Lands (No Action)

Habitat Management Areas (PHMA, GHMA, and OHMA) were derived from modeling efforts (Coates et al., 2014).
No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

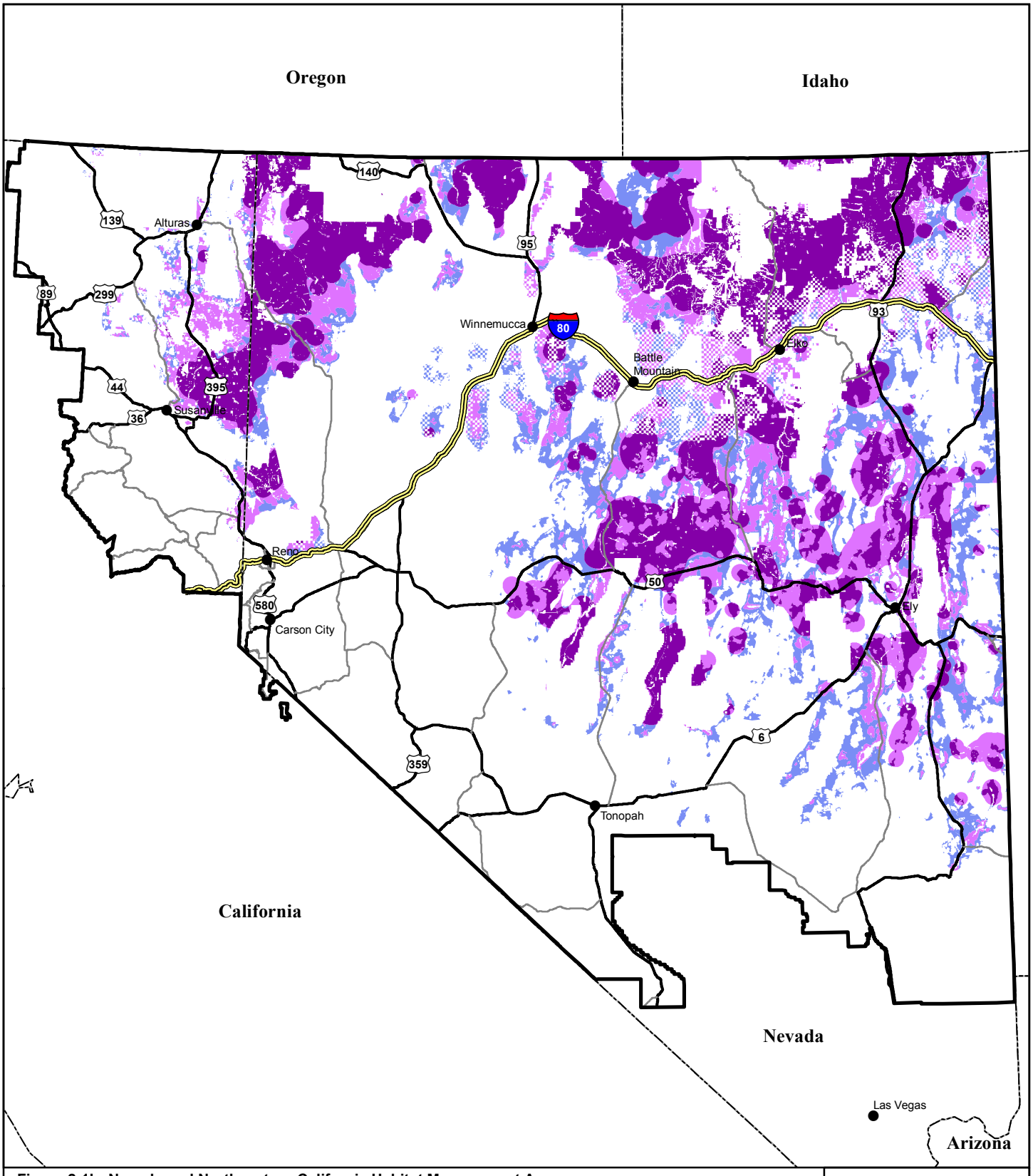


Figure 2-1b: Nevada and Northeastern California Habitat Management Areas on BLM Managed Public Lands (Management Alignment Alternative and Proposed Plan Amendment)

Priority Habitat Management Areas (PHMAs)
General Habitat Management Areas (GHMAs)
Other Habitat Management Areas (OHMAs)

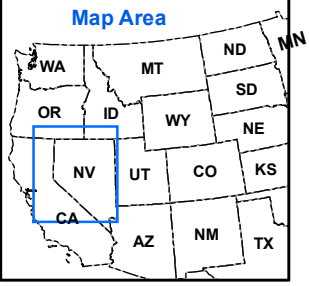
Planning Area Boundary
State Boundary

N
W E
S

0 30 60 Miles

October 2018

Map Area



Habitat Management Areas (PHMA, GHMA, and OHMA) were derived from modeling efforts (Coates et al., 2016, as amended by the State of Nevada through the Nevada Sagebrush Ecosystem Council in December 2015) and the model will be updated approximately every 3-5 years following a similar process for which these maps were approved.
No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

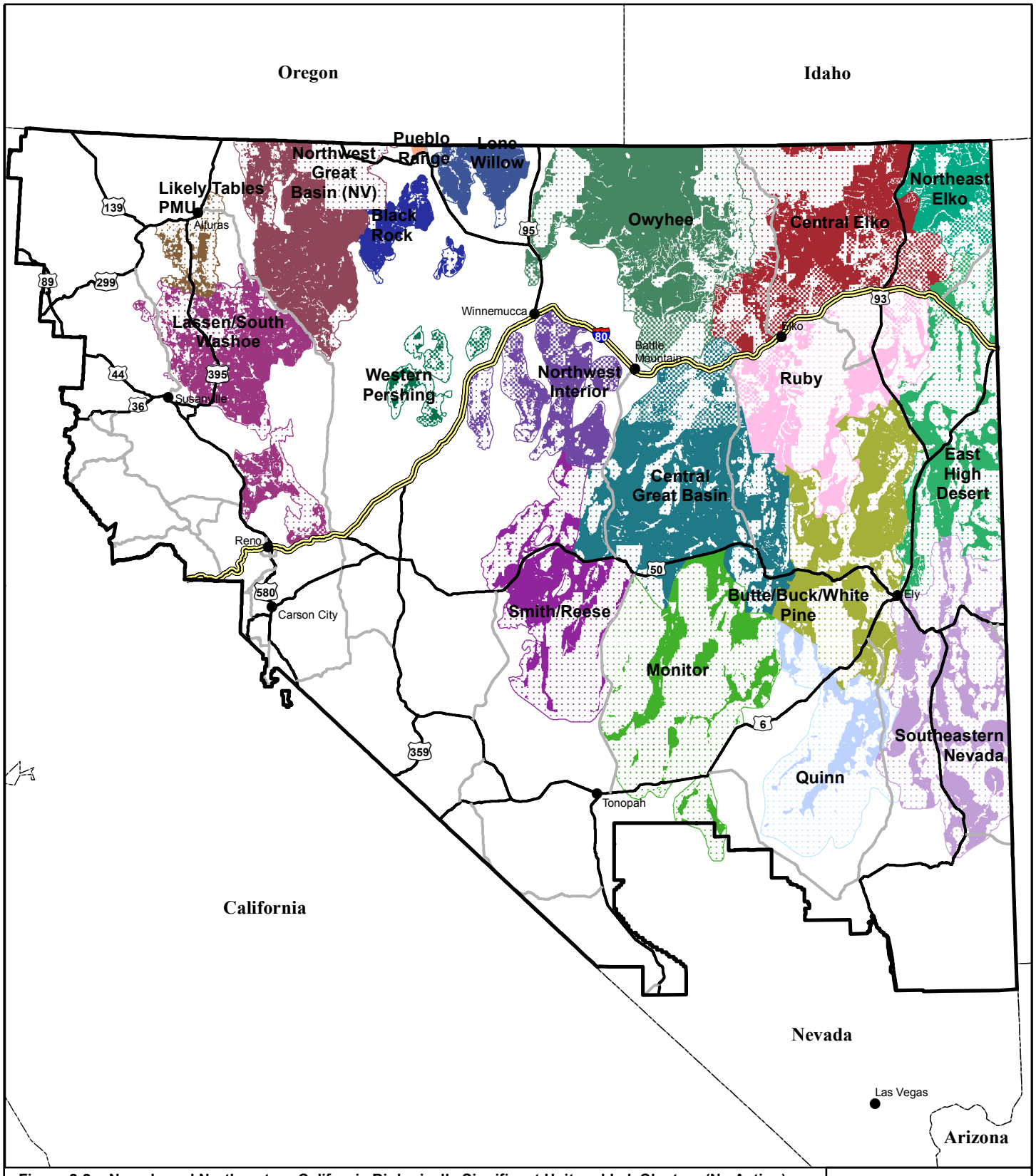


Figure 2-2a: Nevada and Northeastern California Biologically Significant Unit and Lek Clusters (No Action)

Biologically Significant Unit

- Black Rock
- Butte/Buck/White Pine
- Central Elko
- Central Great Basin
- East High Desert
- Lassen/South Washoe
- Likely Tables PMU
- Lone Willow
- Monitor
- Northeast Elko
- Northwest Great Basin (NV)
- Northwest Interior
- Owyhee
- Pueblo Range
- Quinn
- Ruby
- Smith/Reese
- Southeastern Nevada
- Western Pershing

HMA Within BSU

- Black Rock
- Butte/Buck/White Pine
- Central Elko
- Central Great Basin
- East High Desert
- Lassen/South Washoe
- Likely Tables PMU
- Lone Willow
- Monitor
- Northeast Elko
- Northwest Great Basin (NV)
- Northwest Interior
- Owyhee
- Pueblo Range
- Quinn
- Ruby
- Smith/Reese
- Southeastern Nevada
- Western Pershing

Planning Area Boundary
States Boundary

N W E S

0 30 60 Miles

October 2018

Map Area

Habitat Management Areas (PHMA, GHMA, and OHMA) were derived from modeling efforts (Coates et al., 2016, as amended by the State of Nevada) and the model will be updated approximately every 3-5 years.
BSU boundaries were delineated by NDOW in the 2015 ARMPA.
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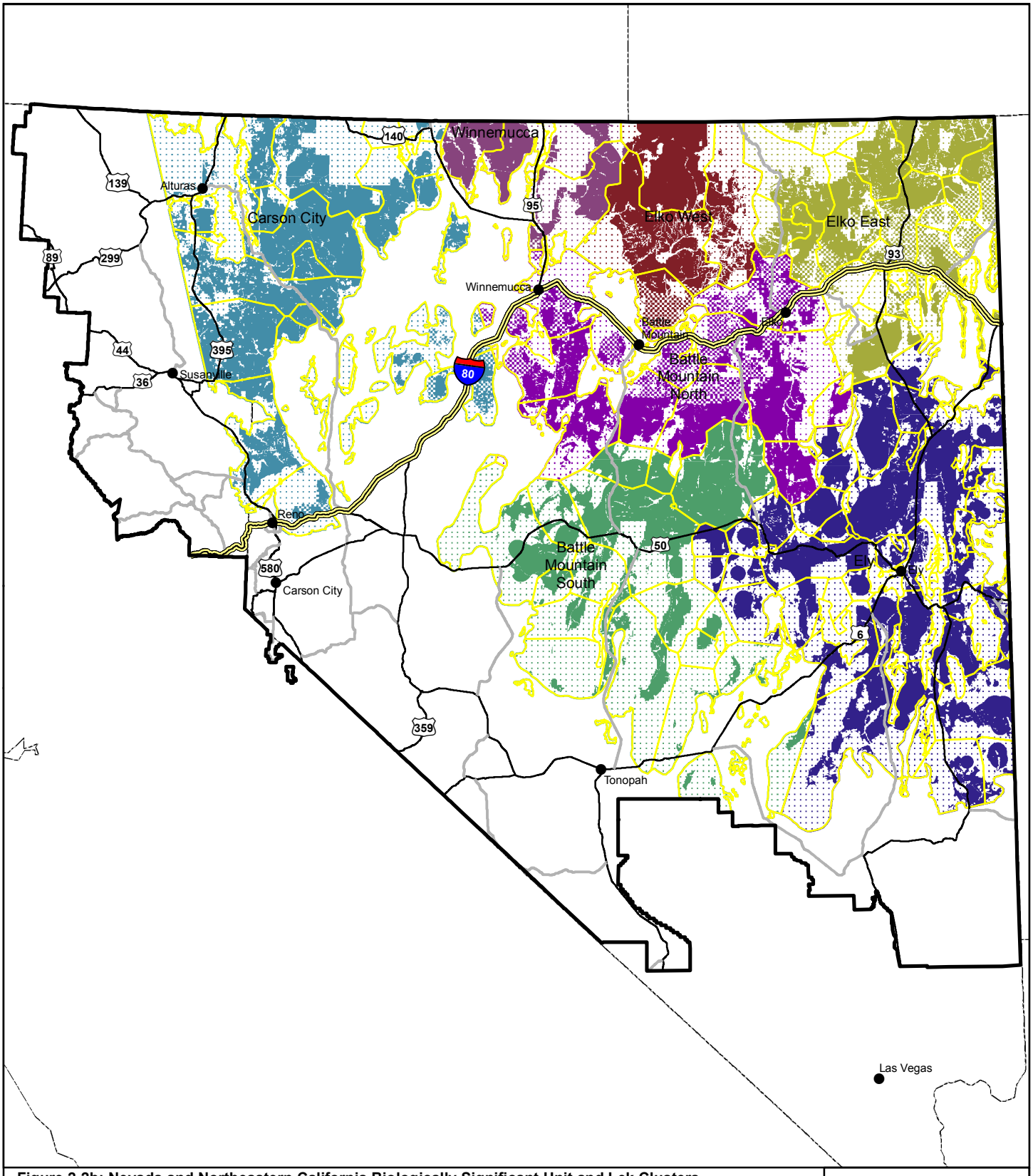


Figure 2-2b: Nevada and Northeastern California Biologically Significant Unit and Lek Clusters (Management Alignment Alternative and Proposed Plan Amendment)

Biologically Significant Unit
- Battle Mountain North
- Battle Mountain South
- Carson City
- Elko East
- Elko West
- Ely
- Winnemucca

HMA Within BSU
- Battle Mountain North
- Battle Mountain South
- Carson City
- Elko East
- Elko West
- Ely
- Winnemucca

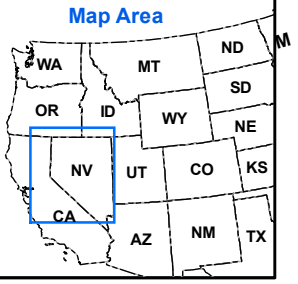
- Lek Cluster Boundary
- Planning Area Boundary
- States Boundary

N W E S

0 30 60 Miles

October 2018

Map Area



Habitat management areas on this map were derived from modeling efforts (Coates et al., 2016, as amended by the State of Nevada through the Nevada Sagebrush Ecosystem Council in December 2015) and the model will be updated approximately every 3-5 years following a similar process for which these maps were approved. BSU and lek cluster boundaries were derived from Coates et al., 2017.
No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

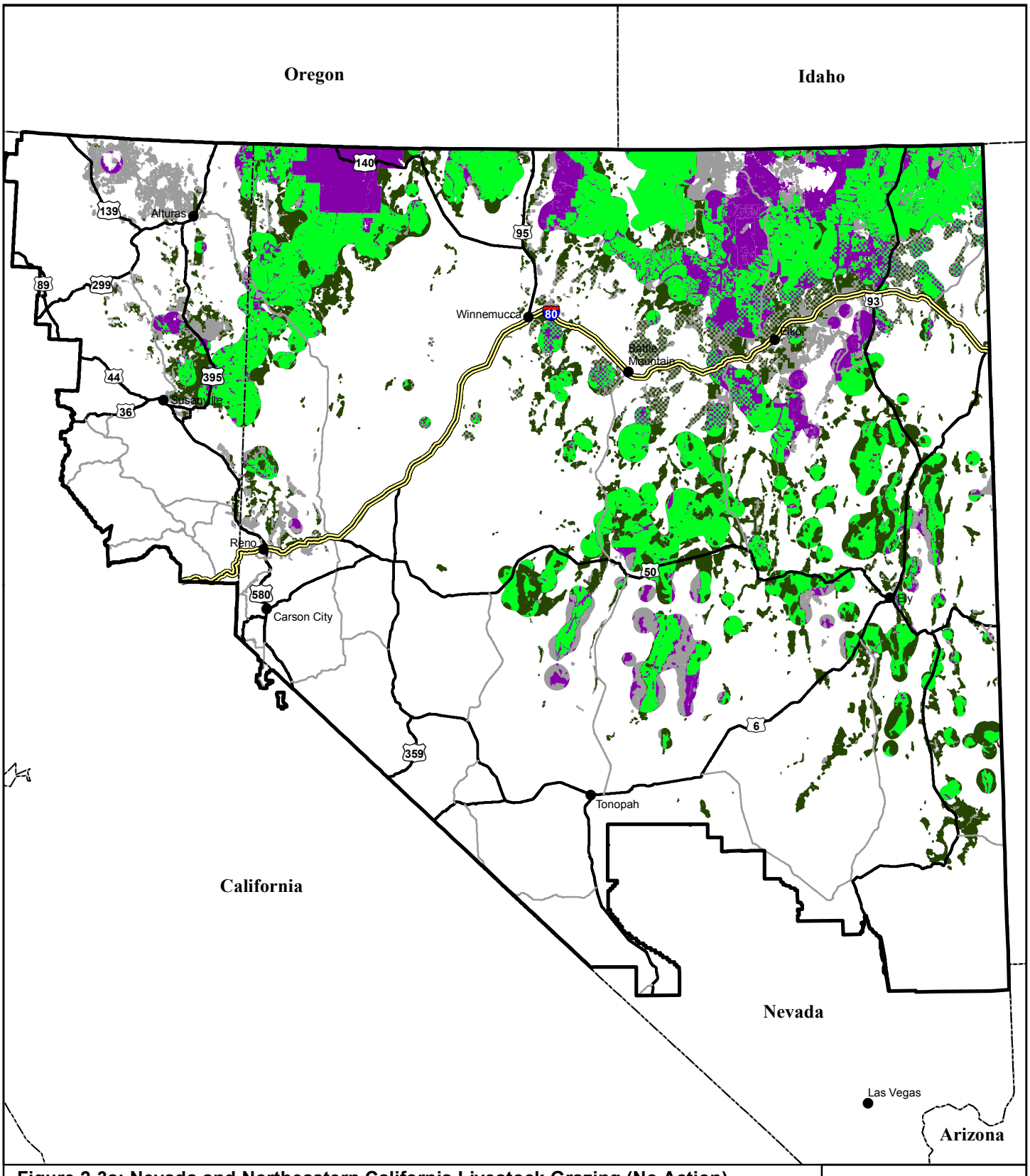


Figure 2-3a: Nevada and Northeastern California Livestock Grazing (No Action)

PHMA GHMA

Outside BLM Decision Area

Areas Available for Livestock Grazing

N/A N/A Areas Unavalible for Livestock Grazing

Planning Area Boundary

State Boundary

N W E S

0 30 60 Miles

October 2018

Map Area

WA MT ND MN SD OR ID WY NE NV UT CO KS CA AZ NM TX

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

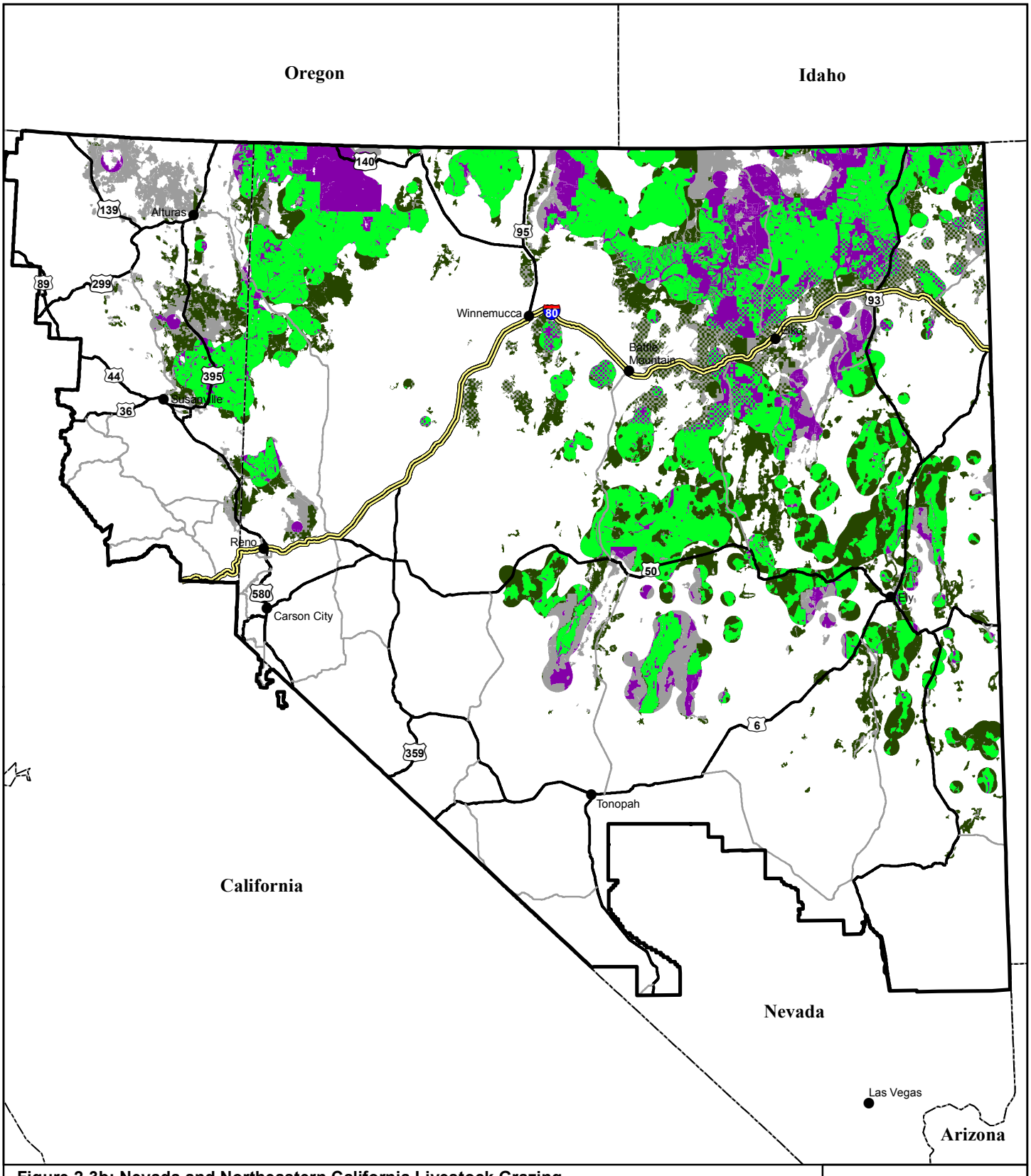


Figure 2-3b: Nevada and Northeastern California Livestock Grazing (Management Alignment Alternative and Proposed Plan Amendment)

PHMA / GHMA

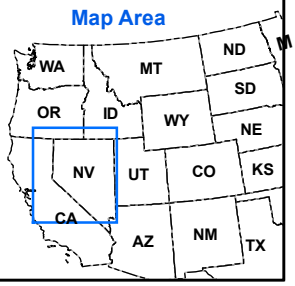
- Outside BLM Decision Area
- Areas Available for Livestock Grazing
- N/A / N/A Areas Unavalible for Livestock Grazing
- Planning Area Boundary
- State Boundary

N S W E

0 30 60 Miles

October 2018

Map Area



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

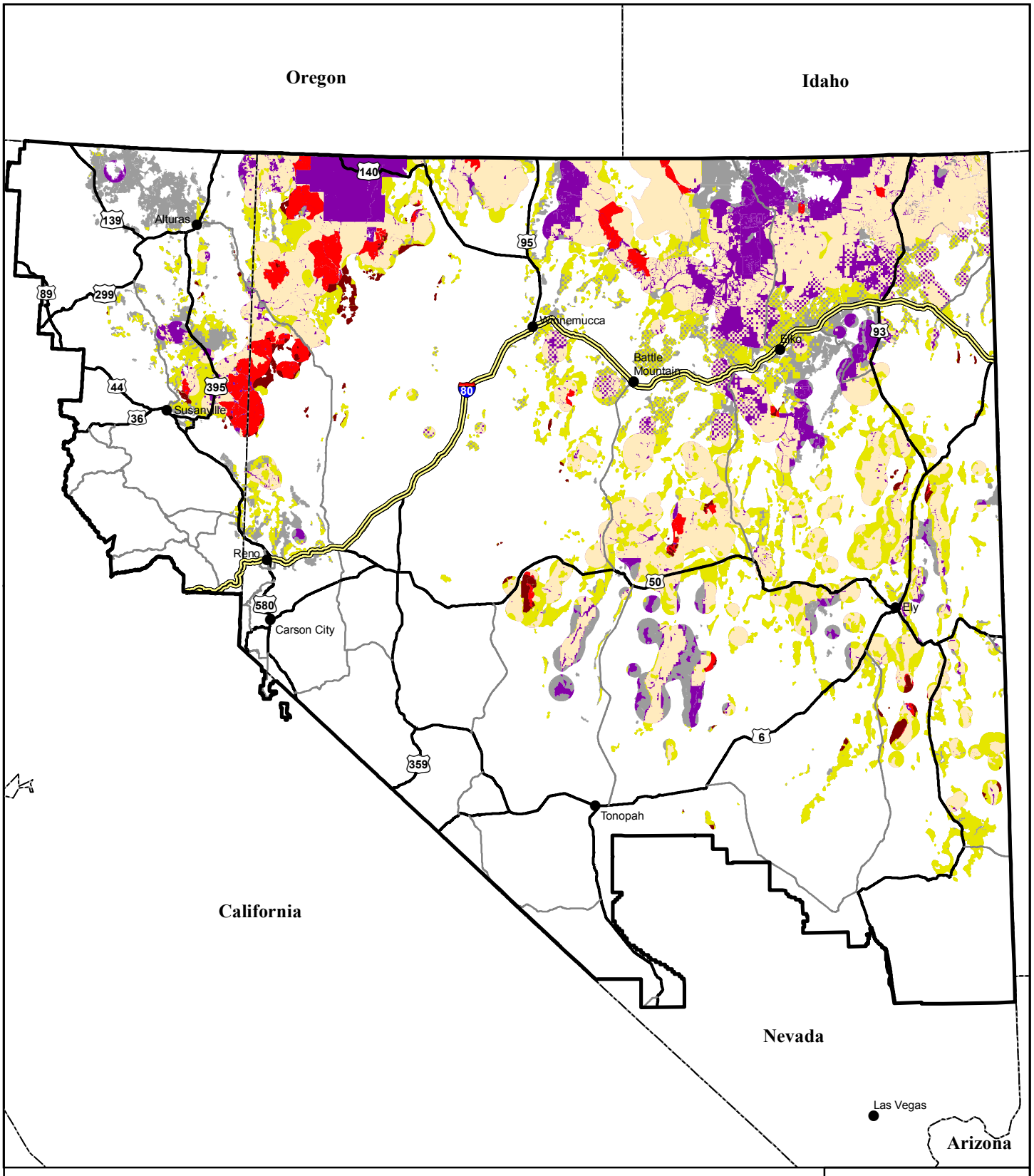


Figure 2-4a: Nevada and Northeastern California Fluid Minerals (Oil, Gas, and Geothermal) (No Action)

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

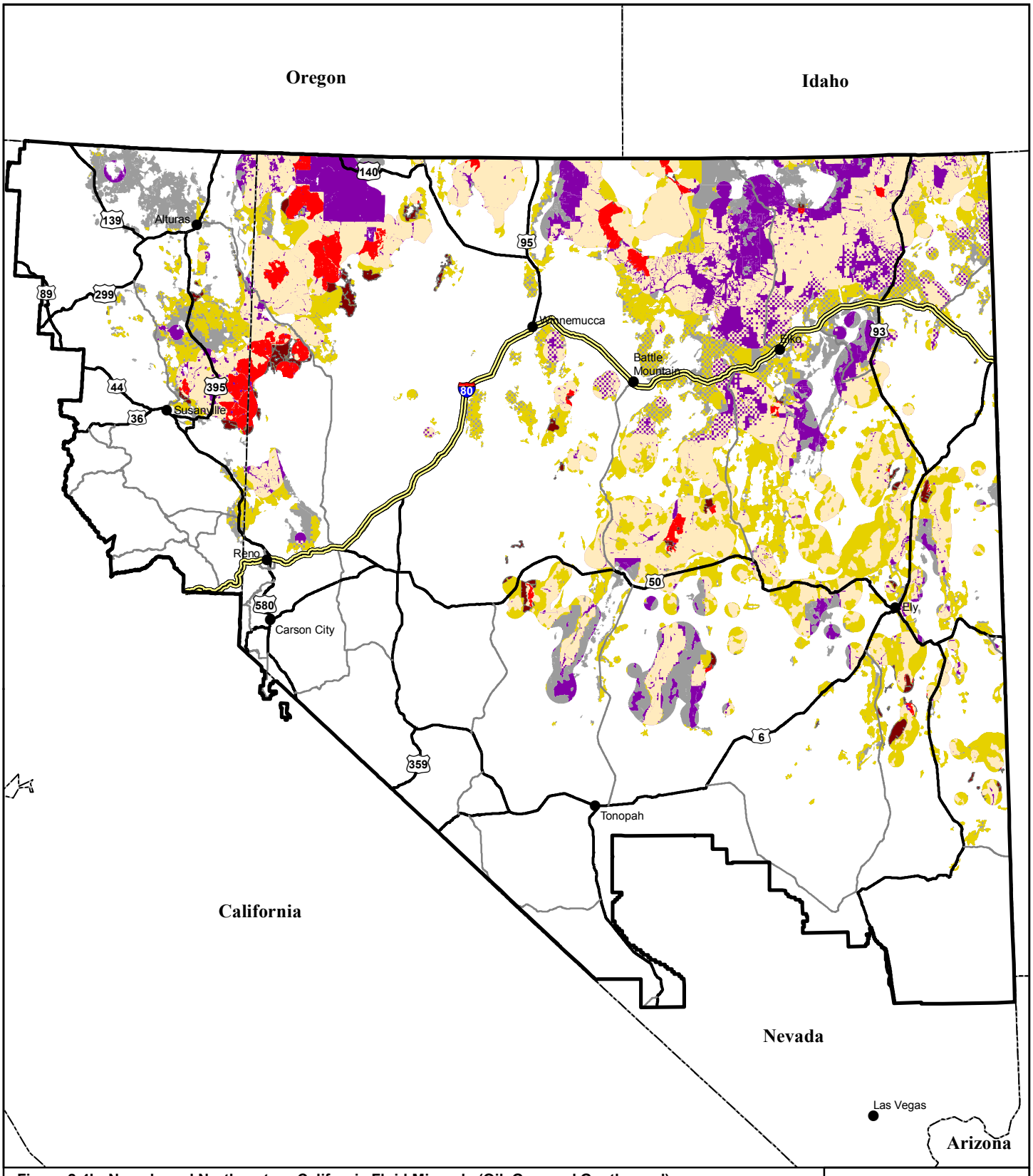


Figure 2-4b: Nevada and Northeastern California Fluid Minerals (Oil, Gas, and Geothermal) (Management Alignment Alternative and Proposed Plan Amendment)

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

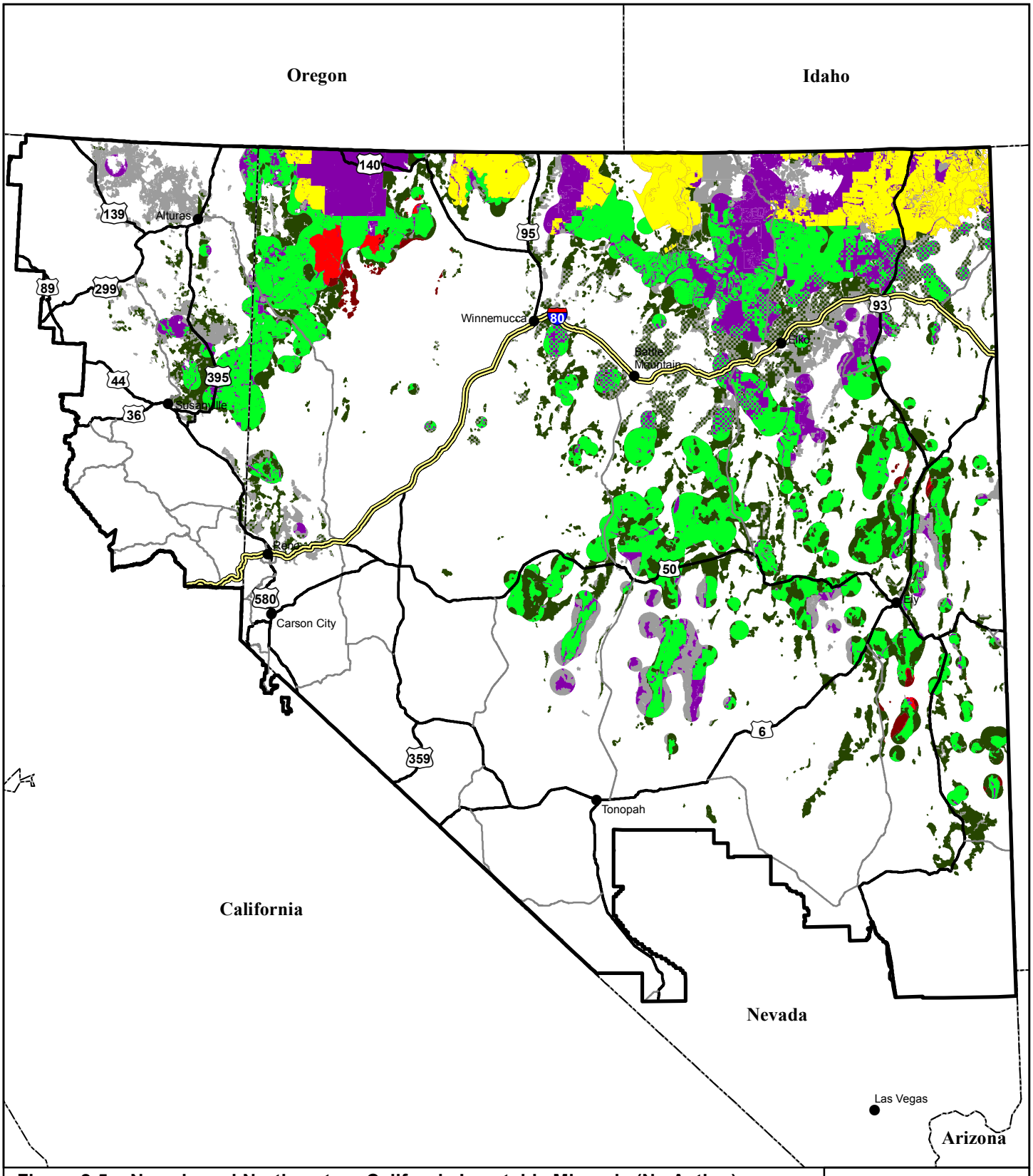


Figure 2-5a: Nevada and Northeastern California Locatable Minerals (No Action)

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

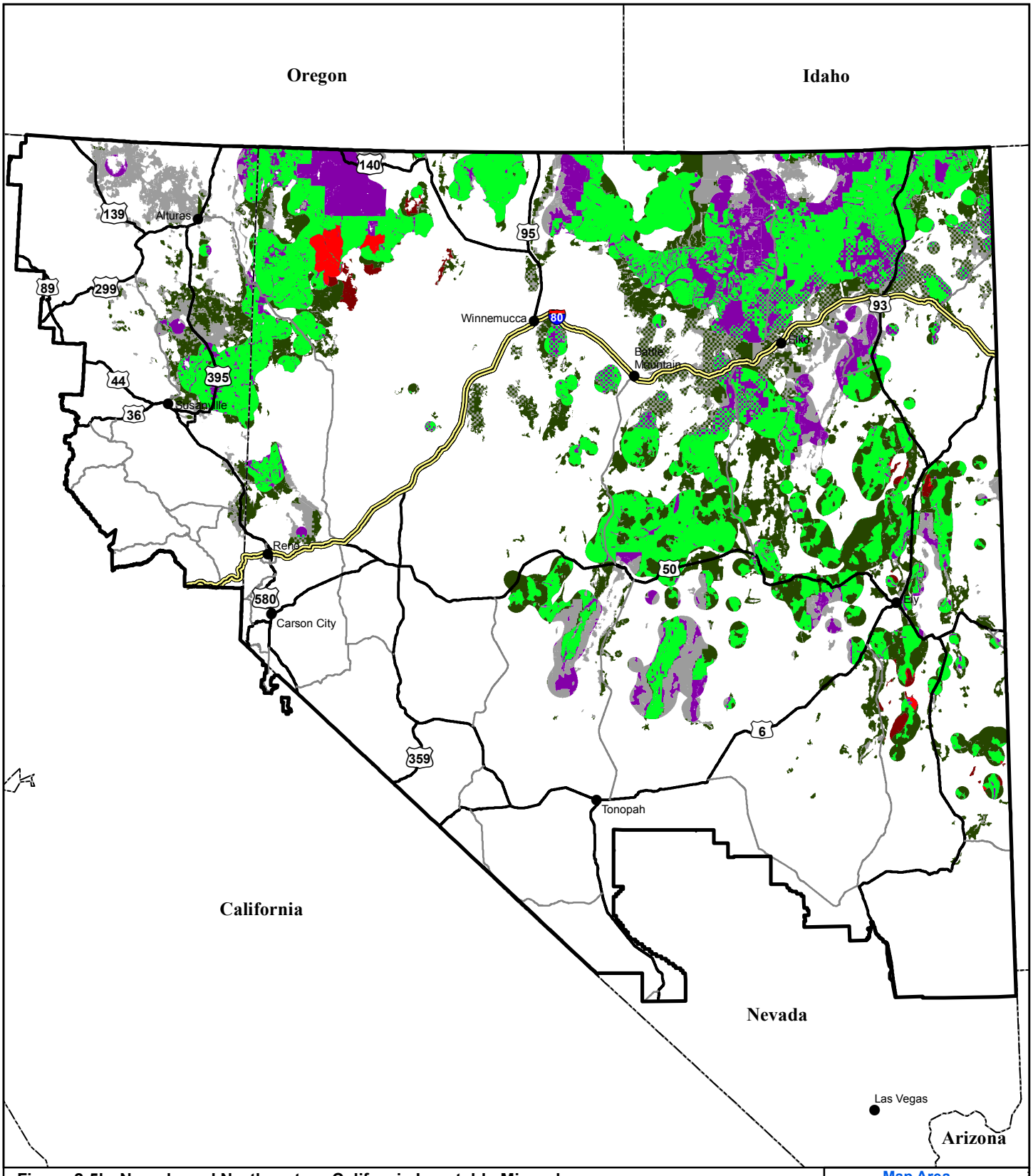


Figure 2-5b: Nevada and Northeastern California Locatable Minerals (Management Alignment Alternative and Proposed Plan Amendment)

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

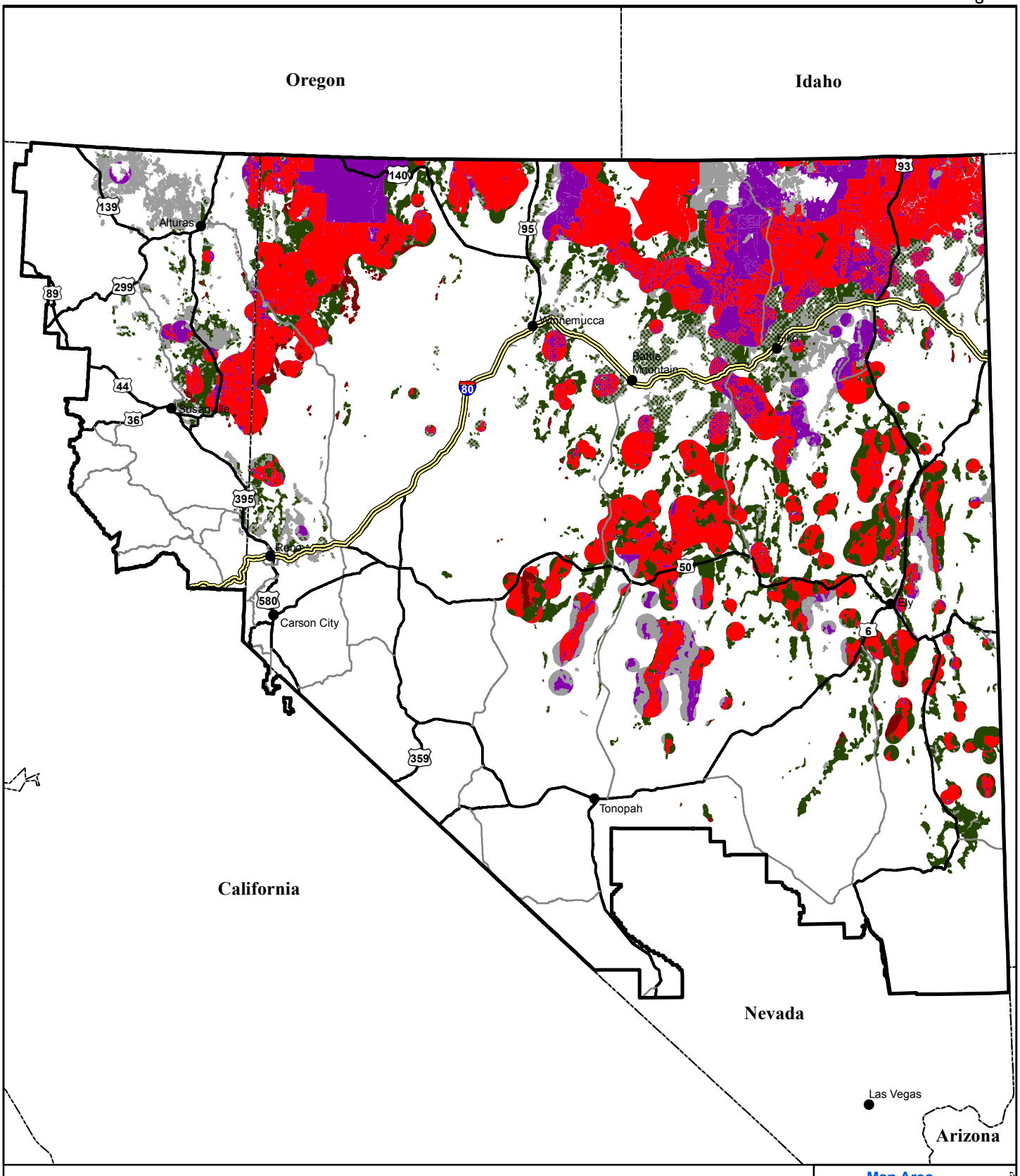


Figure 2-6a: Nevada and Northeastern California Salable Minerals (Mineral Materials) (No Action)

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

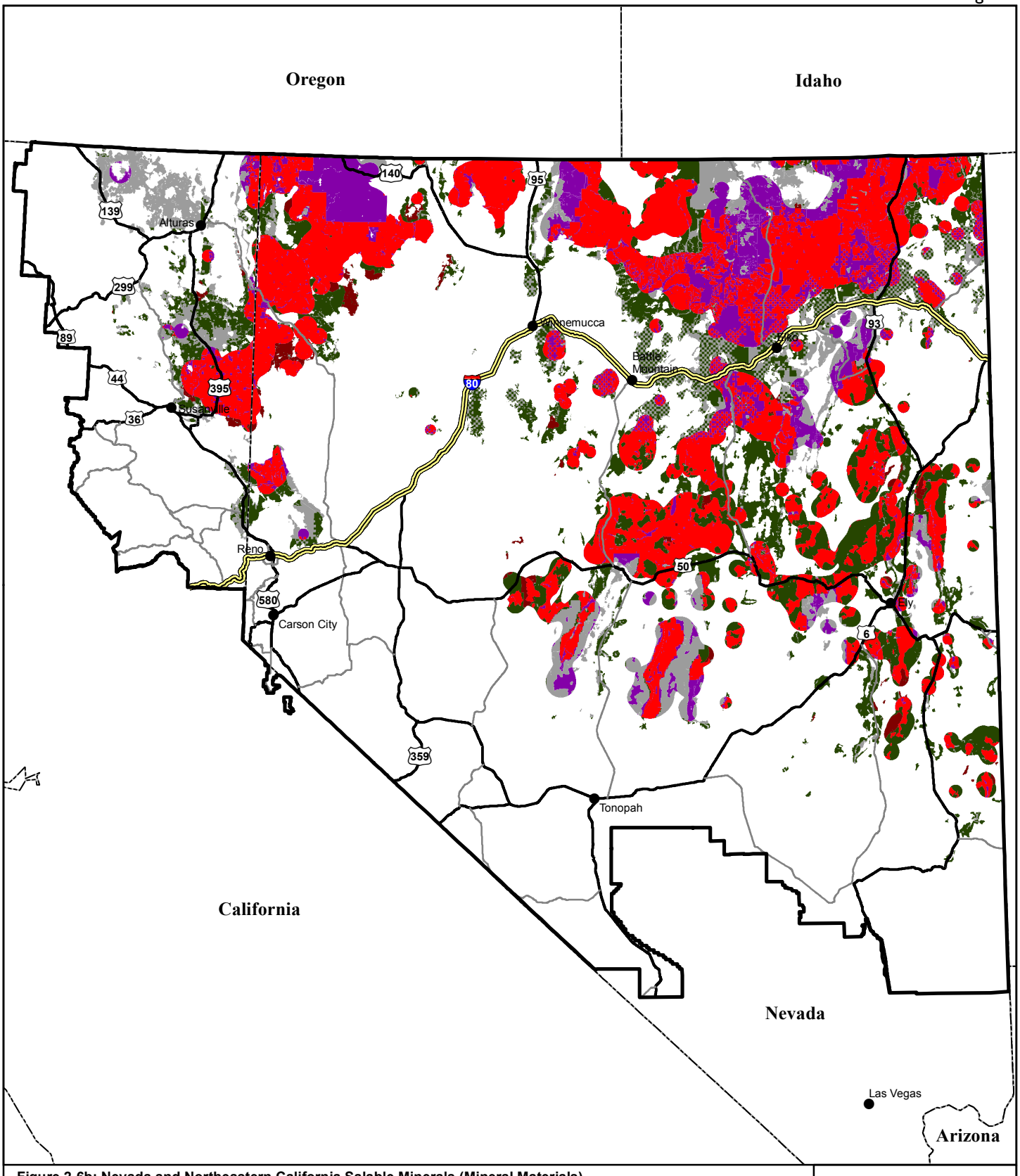


Figure 2-6b: Nevada and Northeastern California Salable Minerals (Mineral Materials) (Management Alignment Alternative and Proposed Plan Amendment)

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

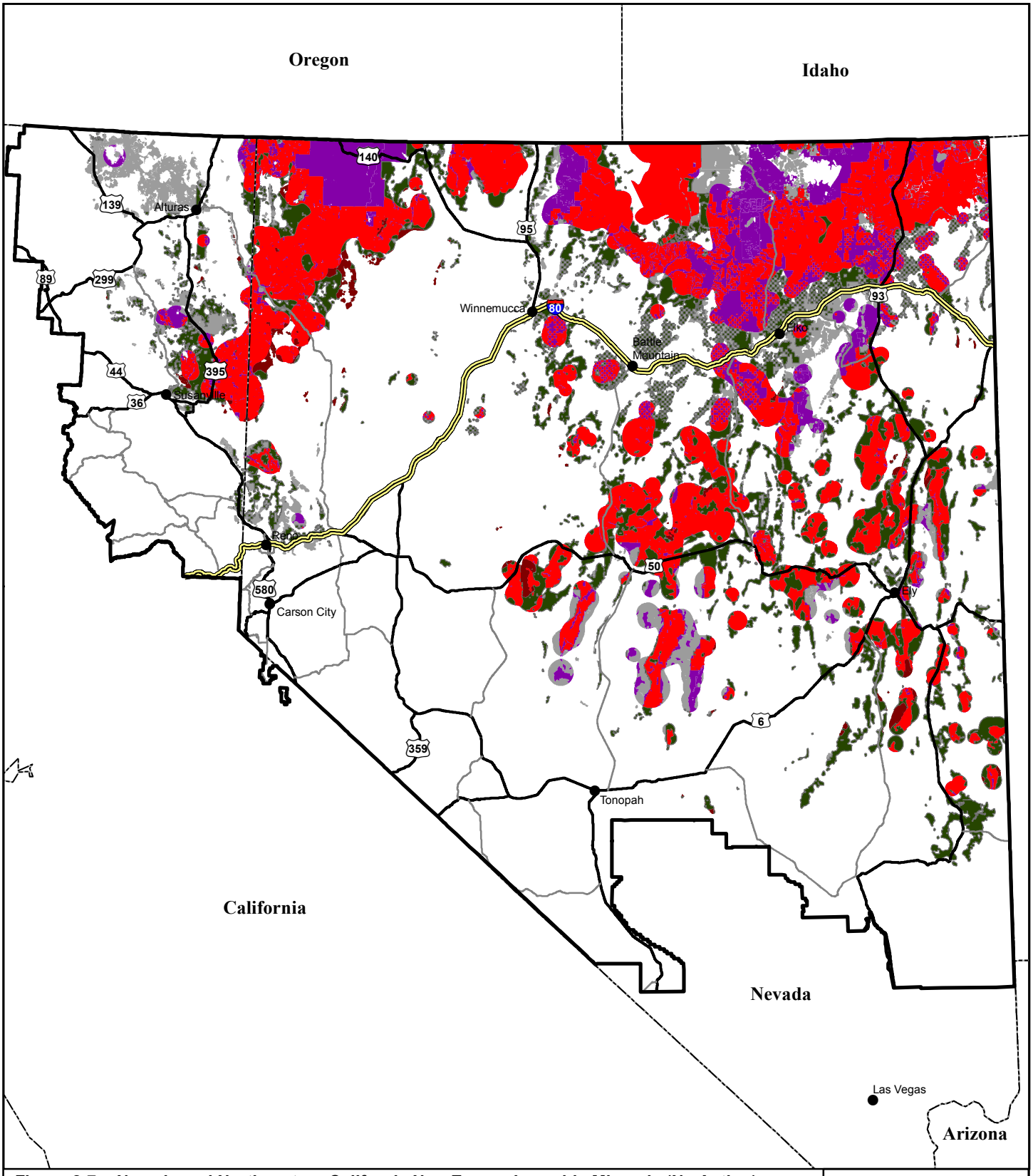


Figure 2-7a: Nevada and Northeastern California Non Energy Leasable Minerals (No Action)

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

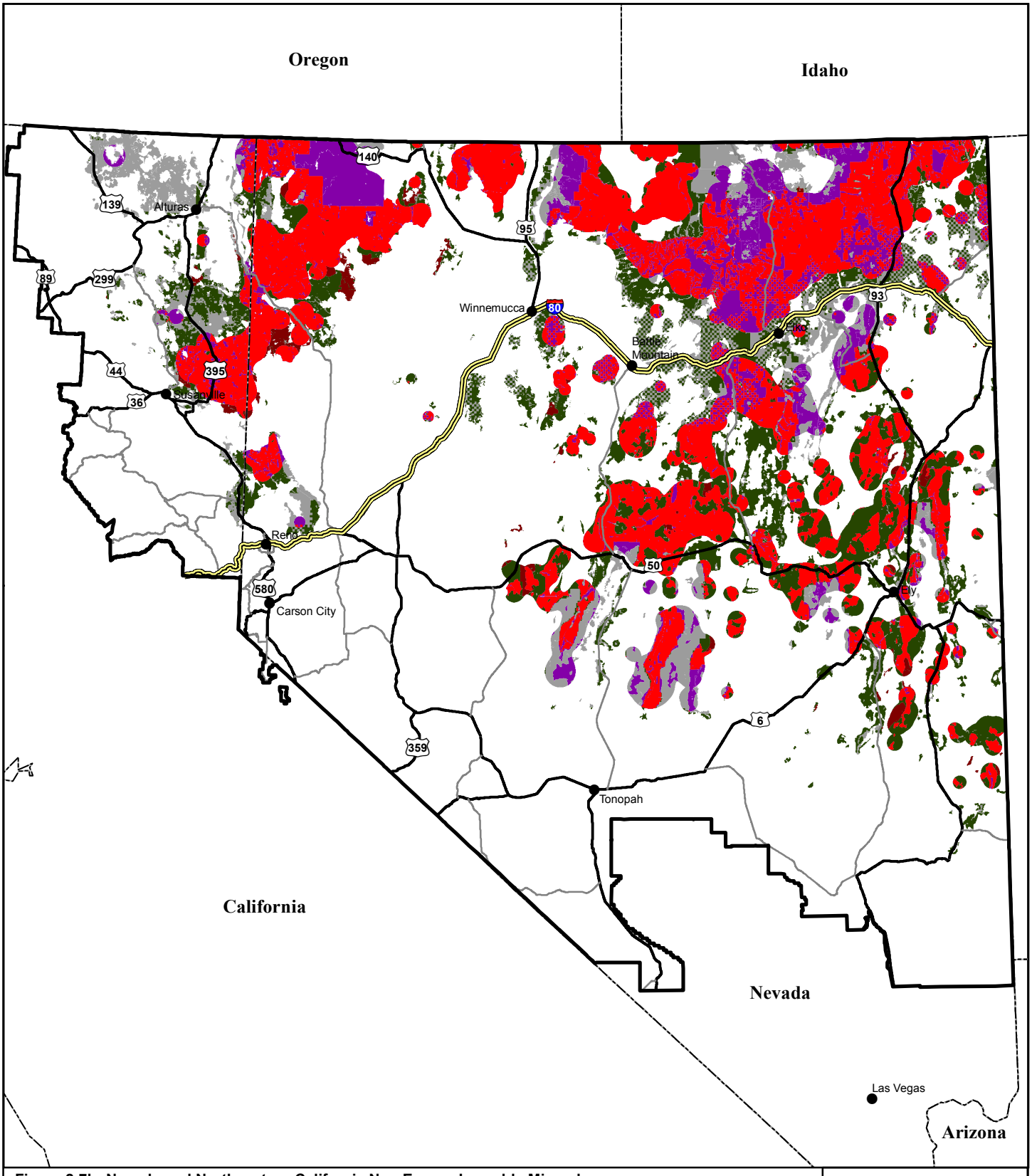


Figure 2-7b: Nevada and Northeastern California Non Energy Leasable Minerals (Management Alignment Alternative and Proposed Plan Amendment)

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

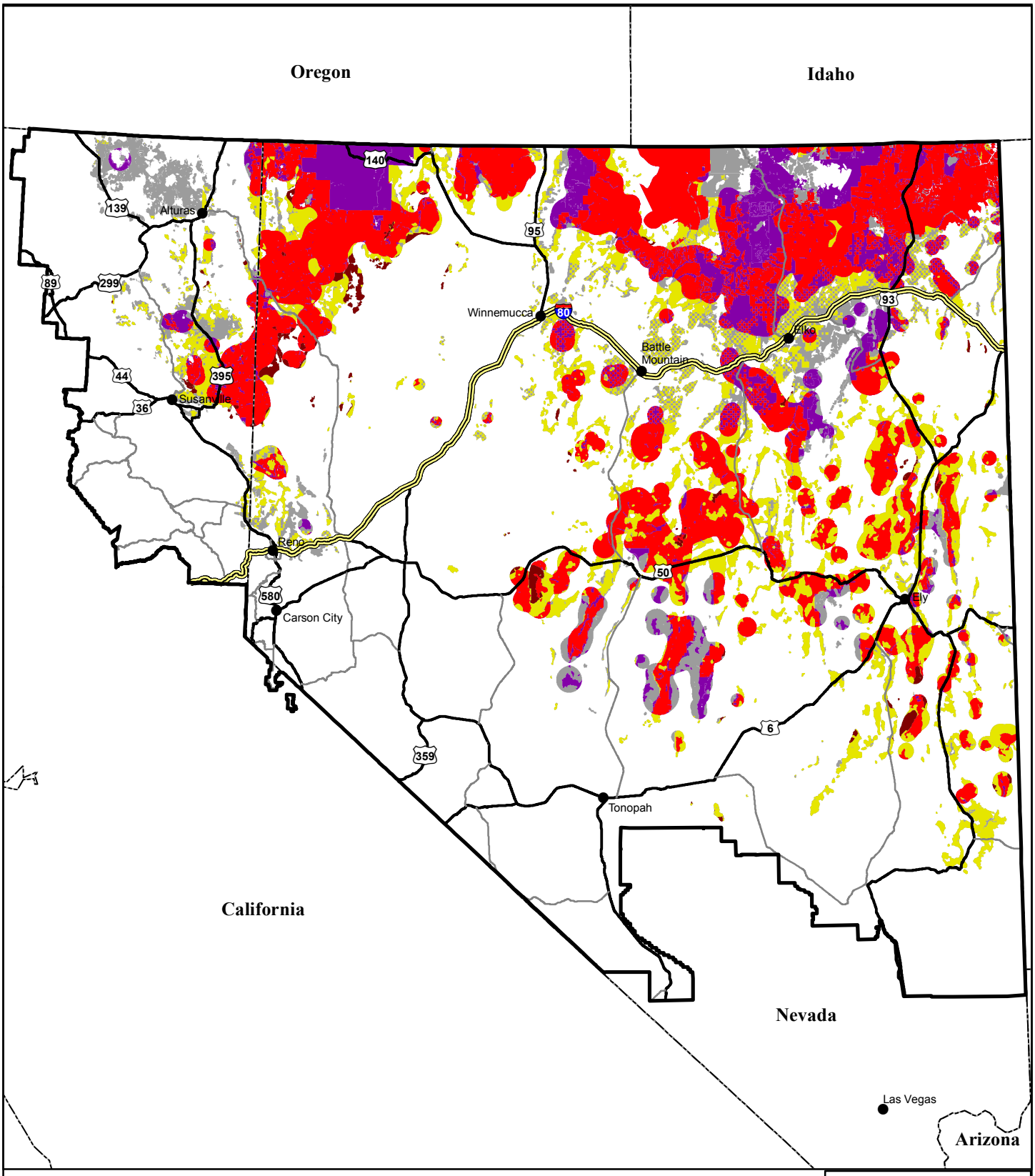


Figure 2-8a: Nevada and Northeastern California Wind (No Action)

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

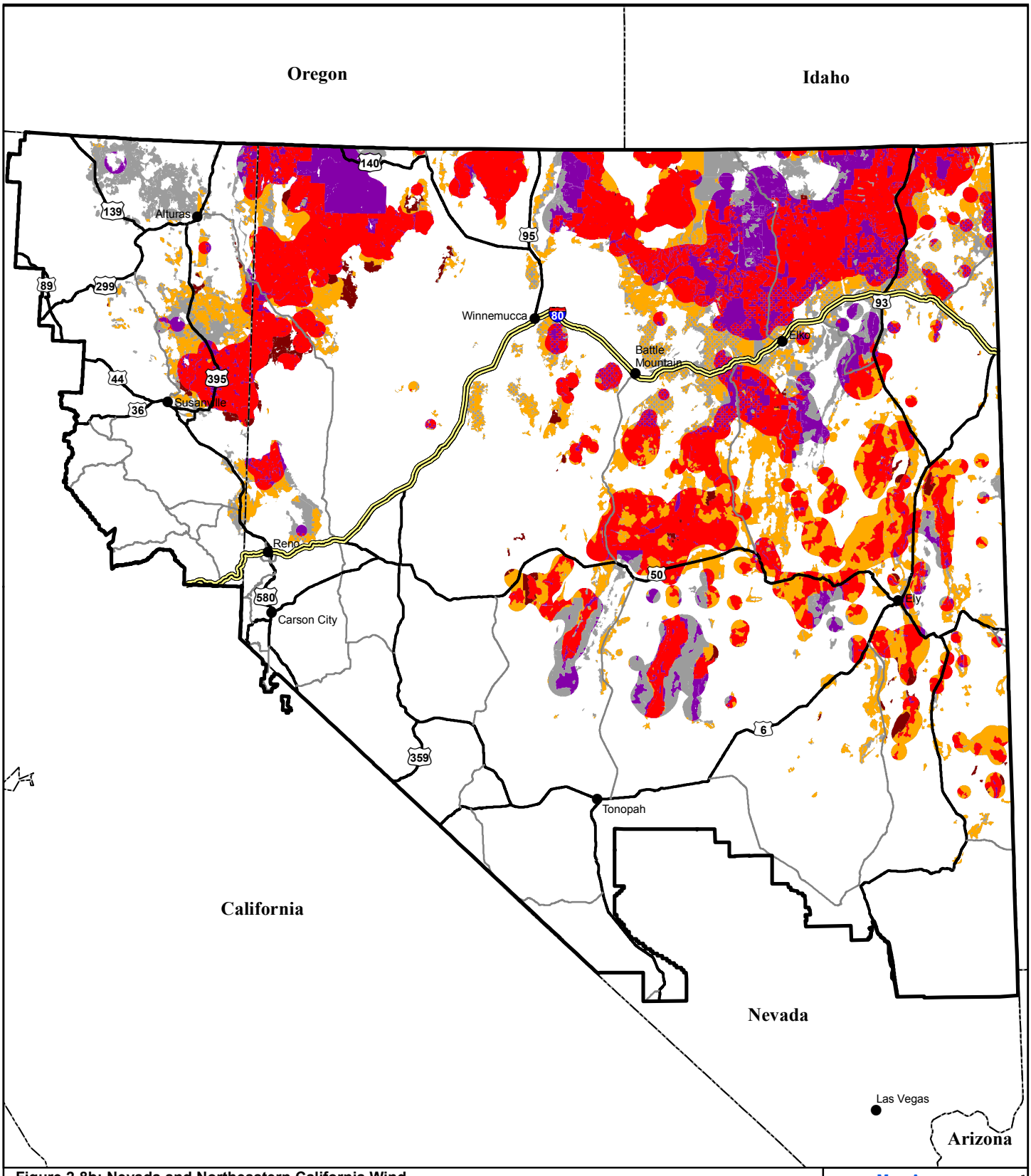


Figure 2-8b: Nevada and Northeastern California Wind (Management Alignment Alternative and Proposed Plan Amendment)

PHMA	GHMA	
		Outside BLM Decision Area
		Exclusion
N/A		Avoidance
N/A	N/A	Open

Planning Area Boundary

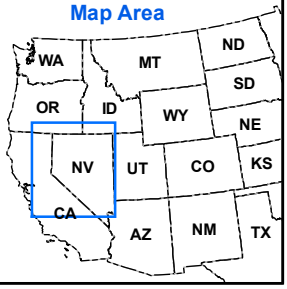
State Boundary

N W E S

0 30 60 Miles

October 2018

Map Area



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

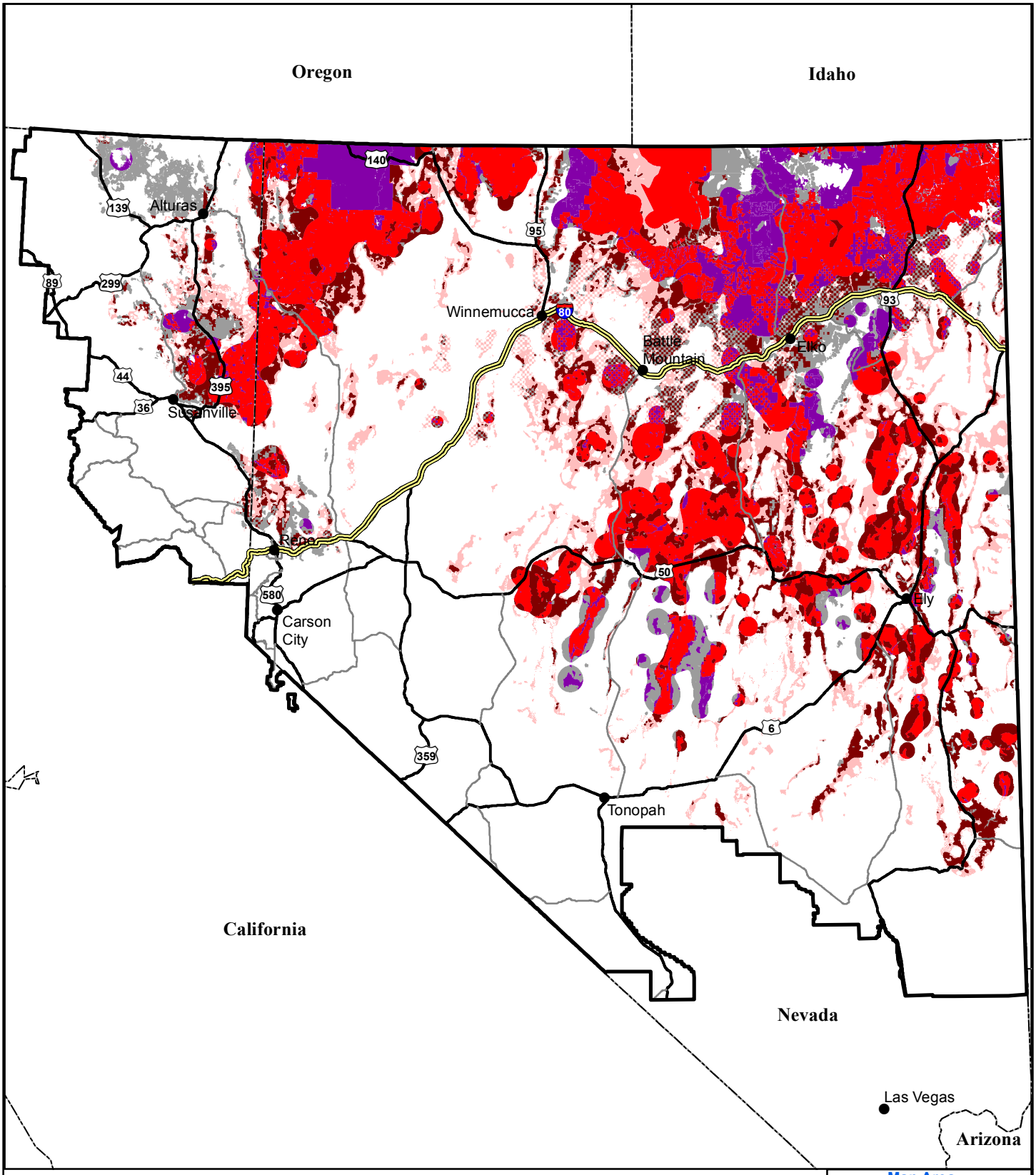


Figure 2-9a: Nevada and Northeastern California Solar (No Action)

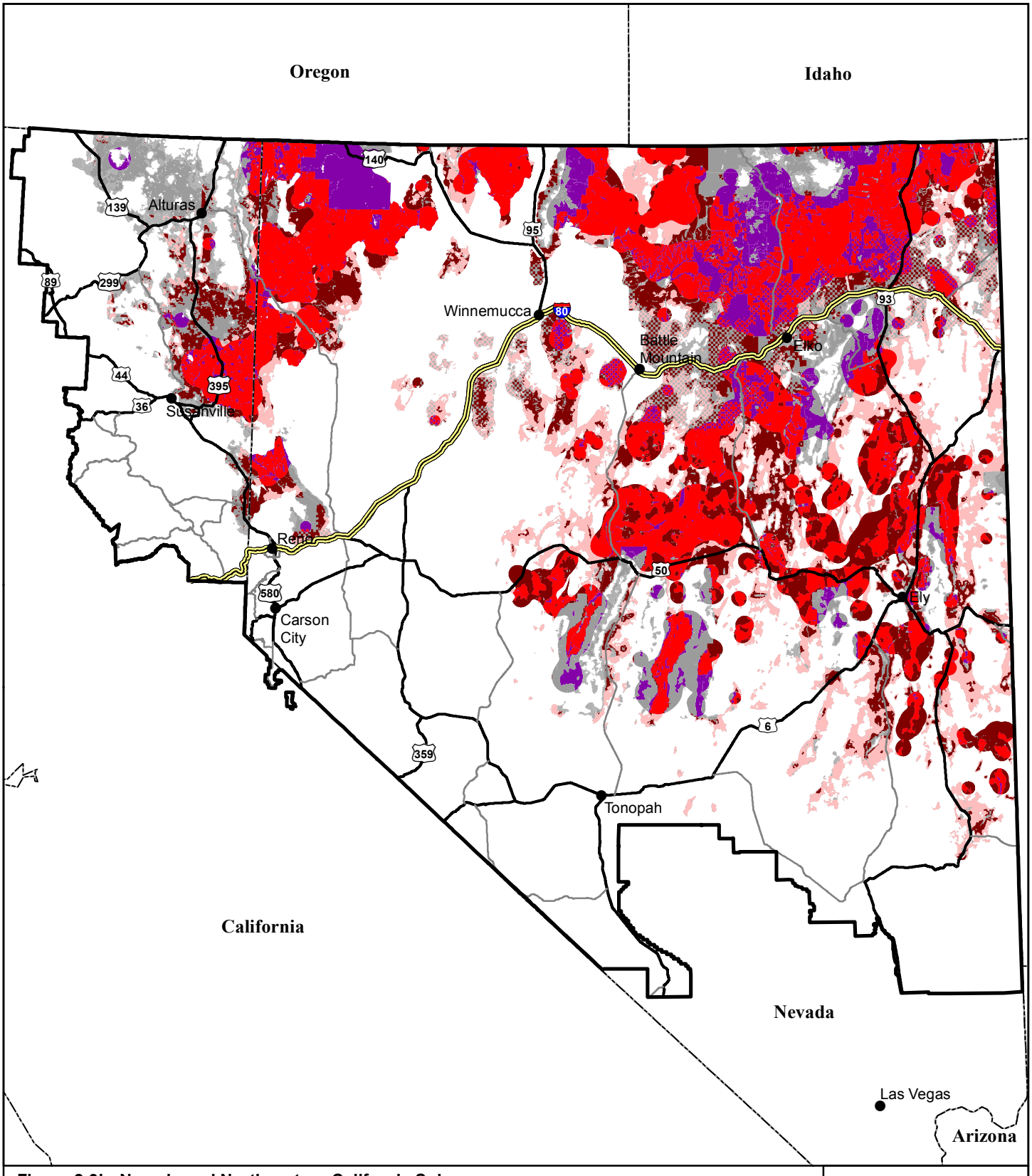


Figure 2-9b: Nevada and Northeastern California Solar (Management Alignment Alternative and Proposed Plan Amendment)

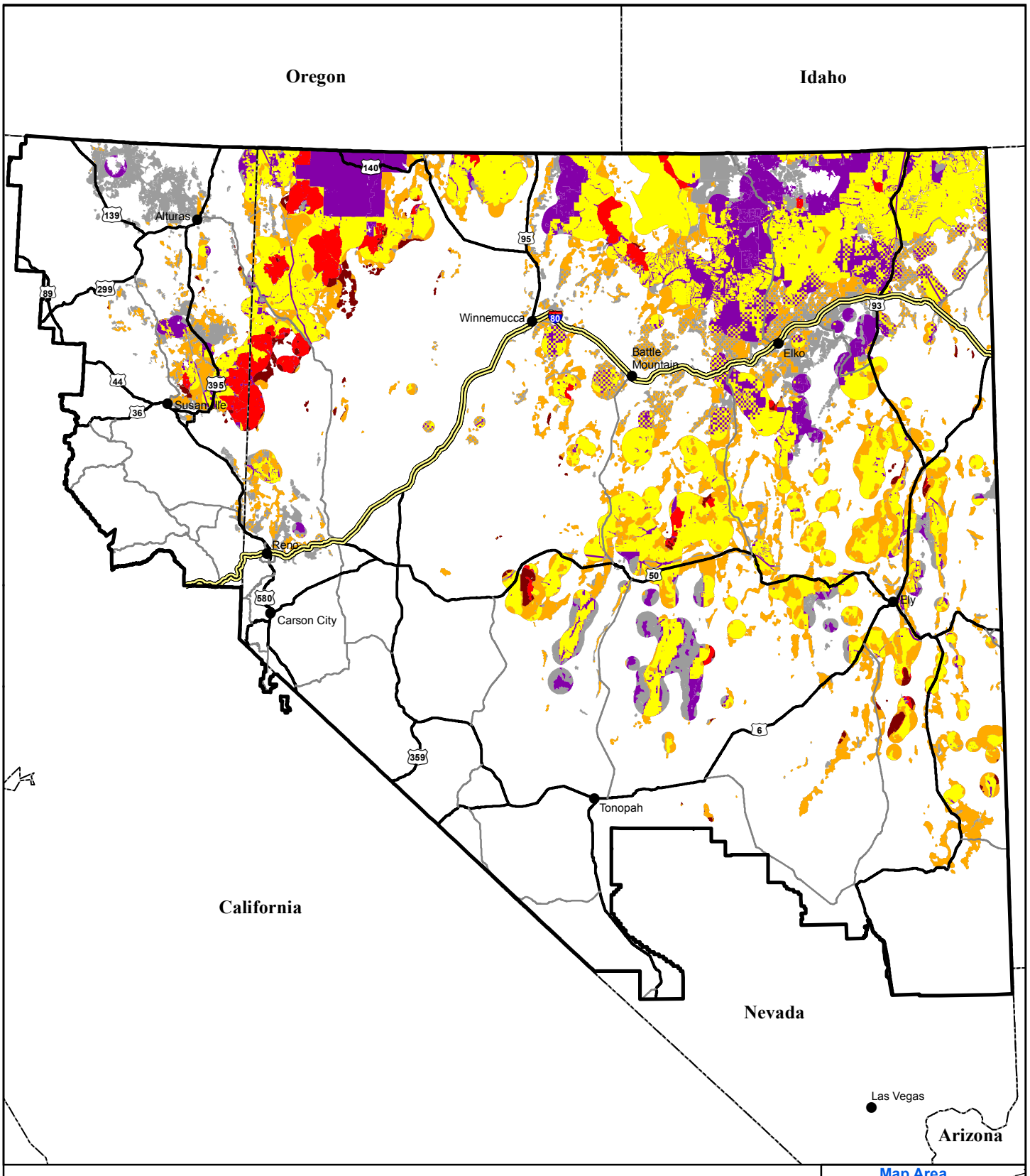


Figure 2-10a: Nevada and Northeastern California Major Rights-of-Way (No Action)

PHMA / GHMA

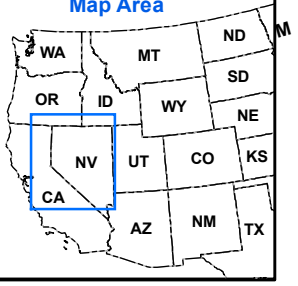
- Outside BLM Decision Area
- Exclusion
- Avoidance
- Planning Area Boundary
- State Boundary

N W E S

0 30 60 Miles

October 2018

Map Area



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

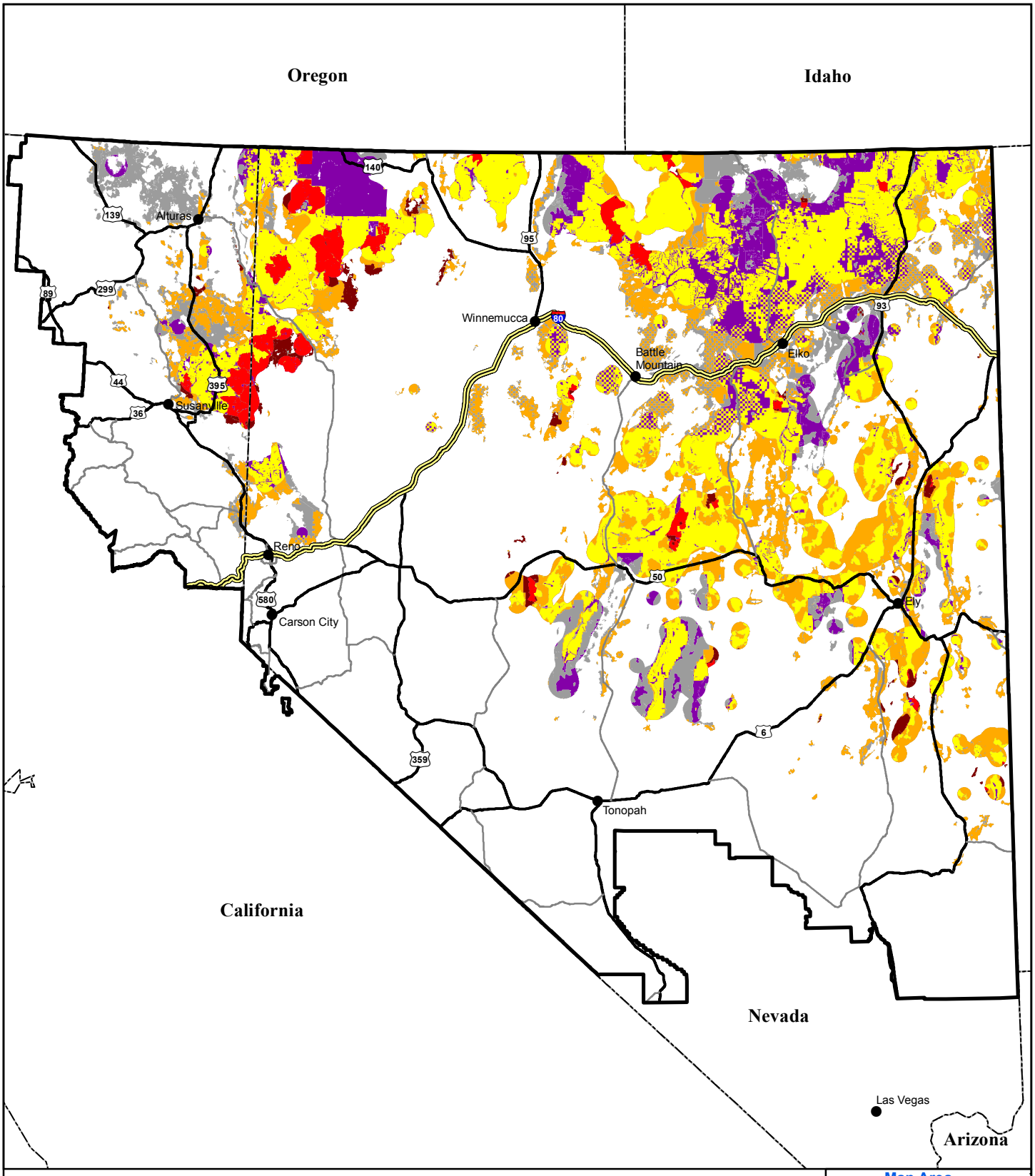


Figure 2-10b: Nevada and Northeastern California Major Rights-of-Way (Management Alignment Alternative and Proposed Plan Amendment)

PHMA / GHMA

- Outside BLM Decision Area
- Exclusion
- Avoidance

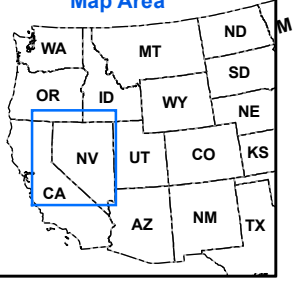
- Planning Area Boundary
- State Boundary

N, W, E, S

0 30 60 Miles

October 2018

Map Area



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

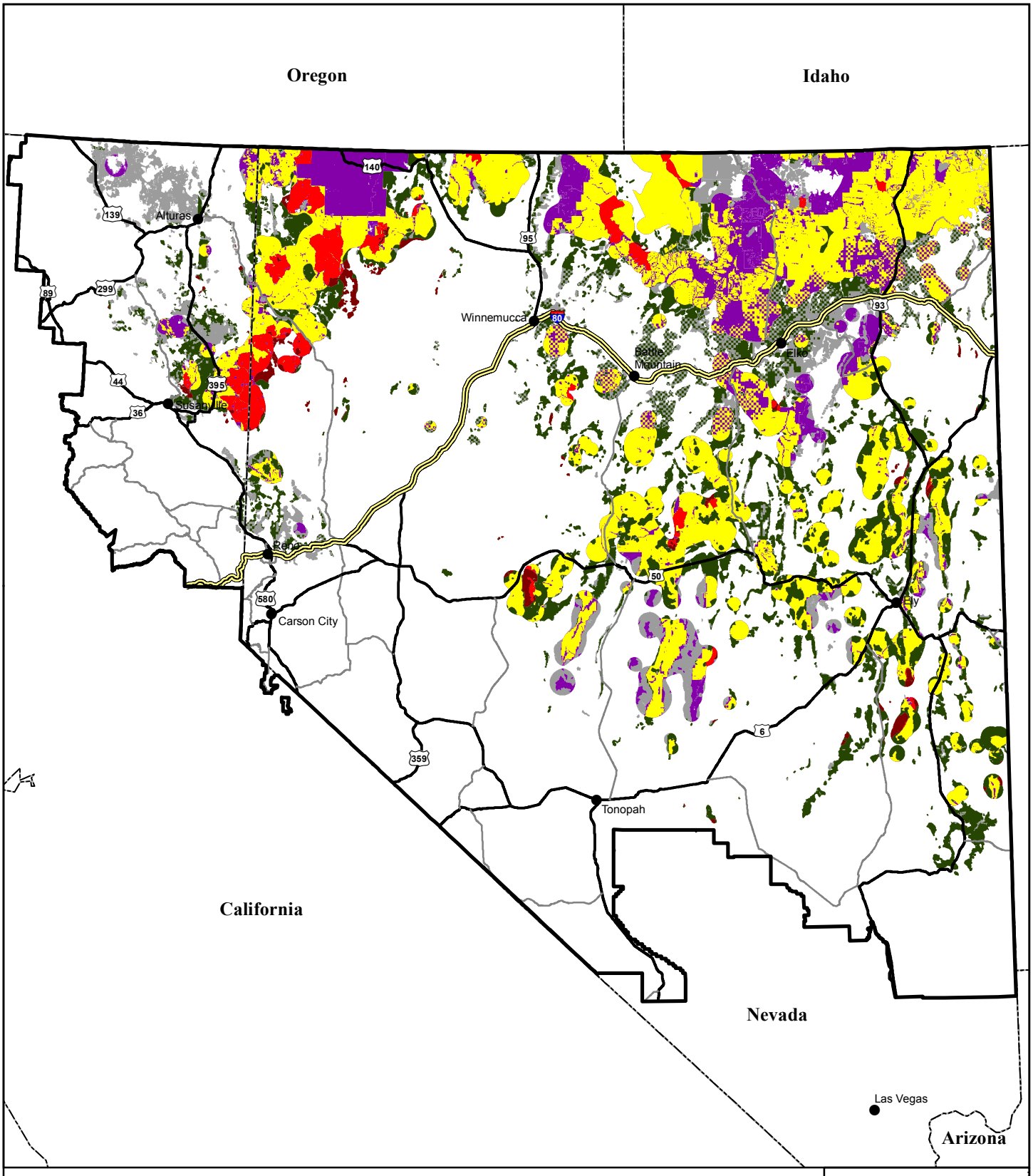


Figure 2-11a: Nevada and Northeastern California Minor Rights-of-Way (No Action)

PHMA / GHMA

- Outside BLM Decision Area
- Exclusion
- N/A — Avoidance
- N/A — Open

Planning Area Boundary

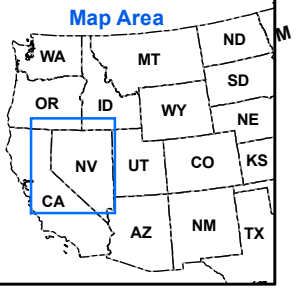
State Boundary

N W E S

0 30 60 Miles

October 2018

Map Area



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

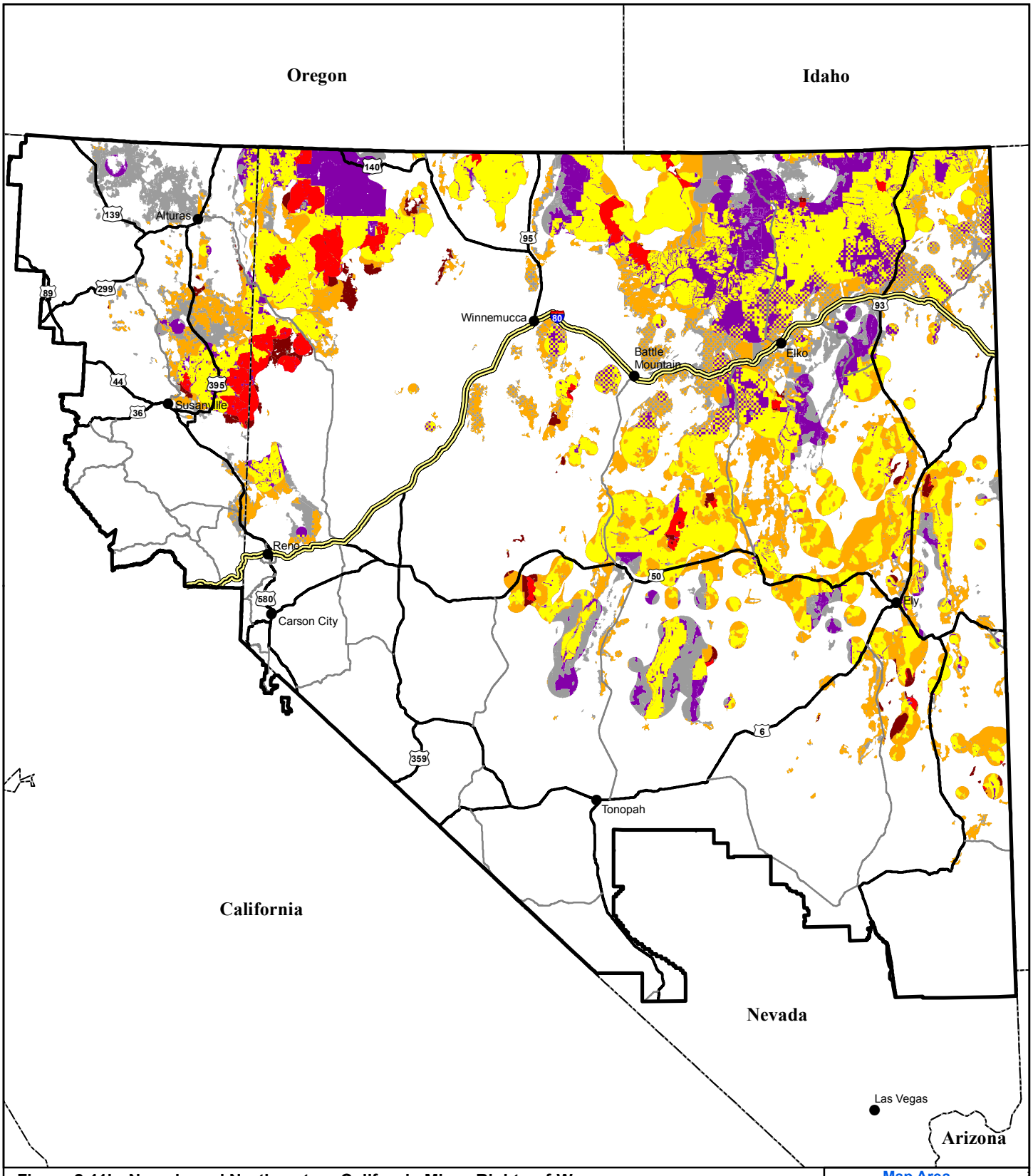


Figure 2-11b: Nevada and Northeastern California Minor Rights-of-Way (Management Alignment Alternative and Proposed Plan Amendment)

PHMA GHMA

Outside BLM Decision Area
Exclusion
Avoidance

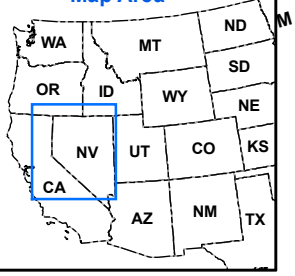
Planning Area Boundary
State Boundary

N W E S

Miles
0 30 60

October 2018

Map Area



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

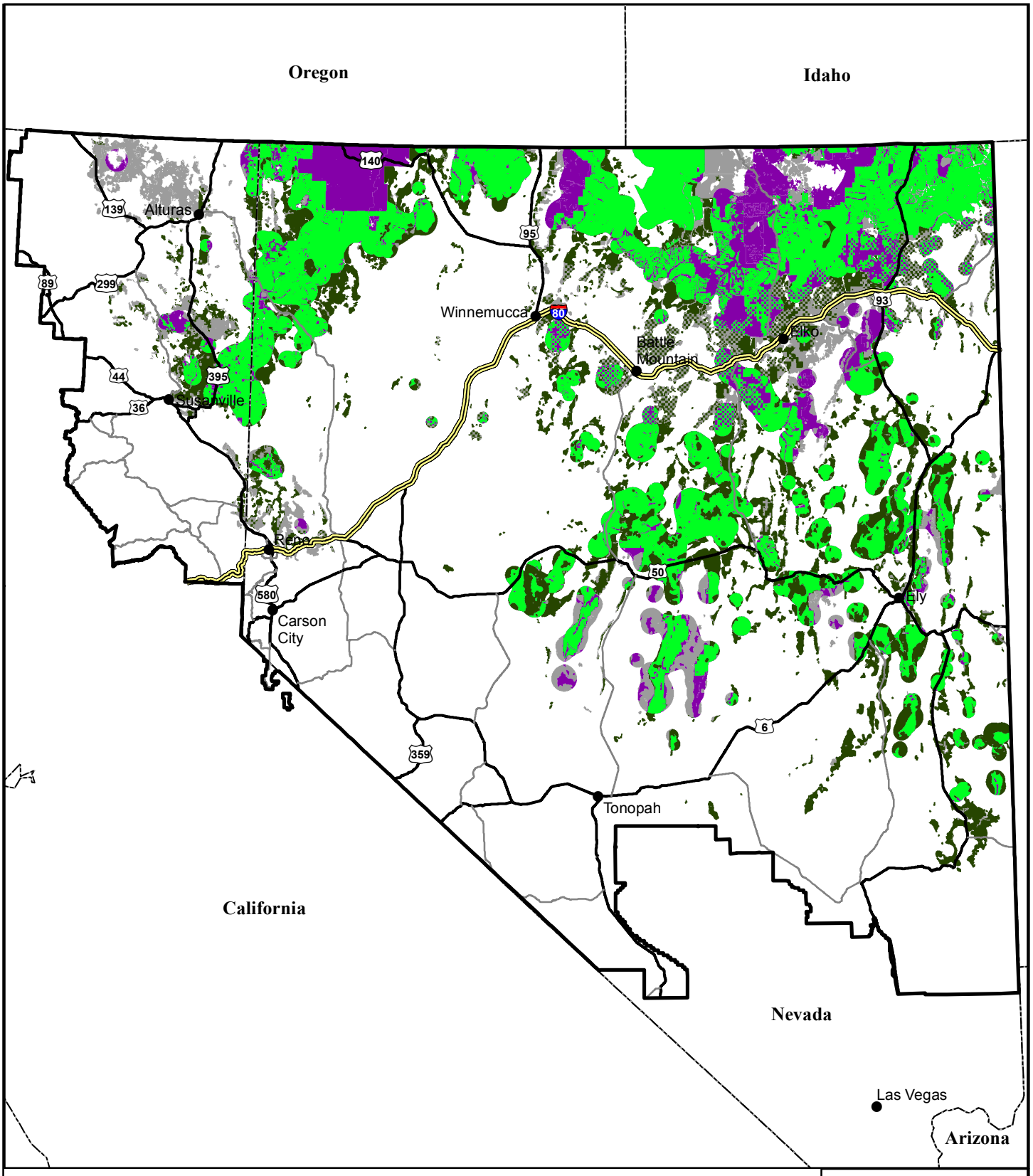
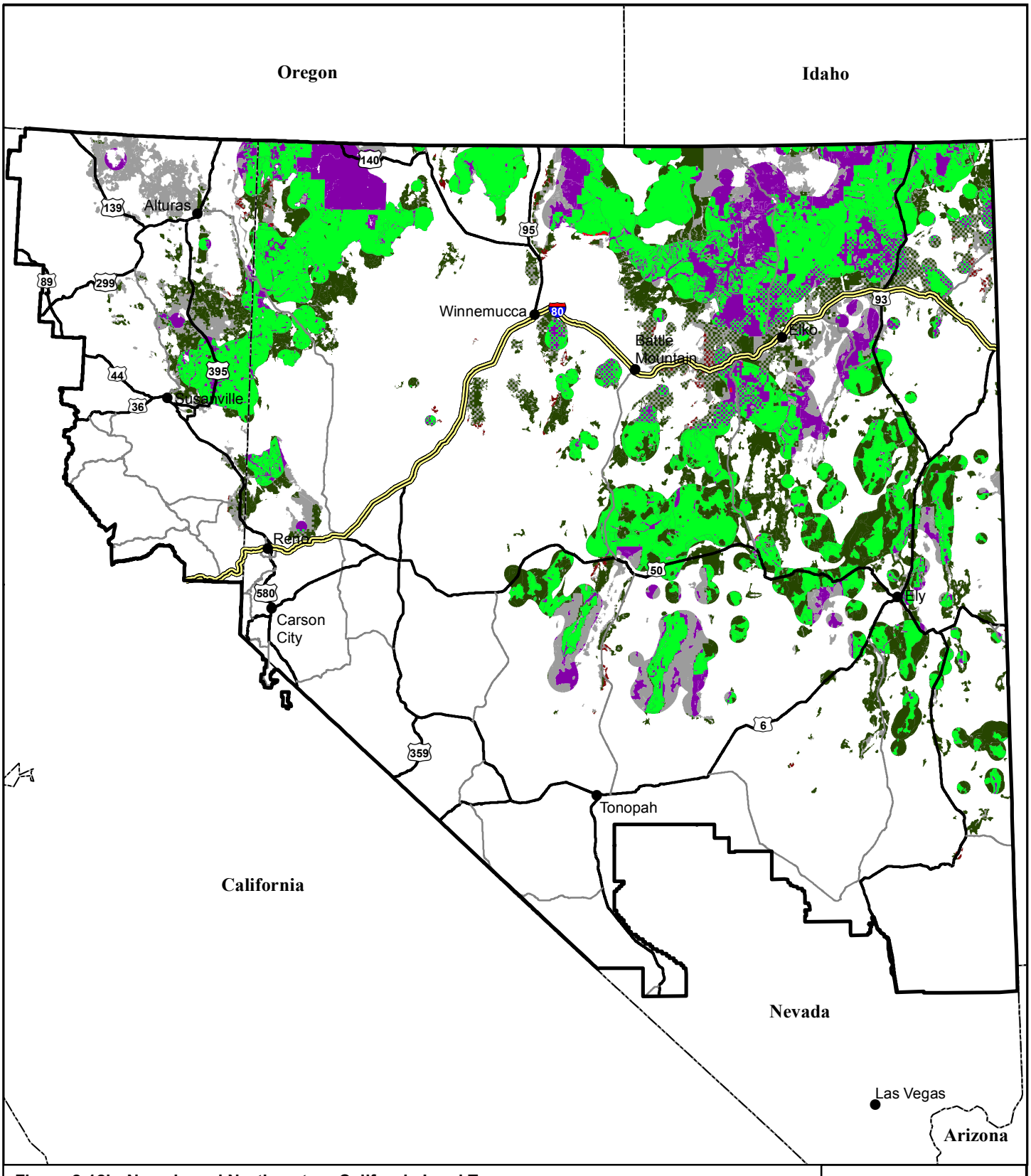


Figure 2-12a: Nevada and Northeastern California Land Tenure (No Action)


Oregon
Idaho
California
Nevada
Arizona
Alturas
Susanville
Reno
Carson City
Winnemucca
Battle Mountain
Elko
Ely
Tonopah
Las Vegas
140
139
89
299
395
44
36
95
80
93
50
580
6
359
Figure 2-12b: Nevada and Northeastern California Land Tenure
(Management Alignment Alternative and Proposed Plan Amendment)
PHMA
GHMA
Outside BLM Decision Area
Retention
Exclusion
Planning Area Boundary
State Boundary
N
W
E
S
Miles
0
30
60
October 2018
Map Area
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

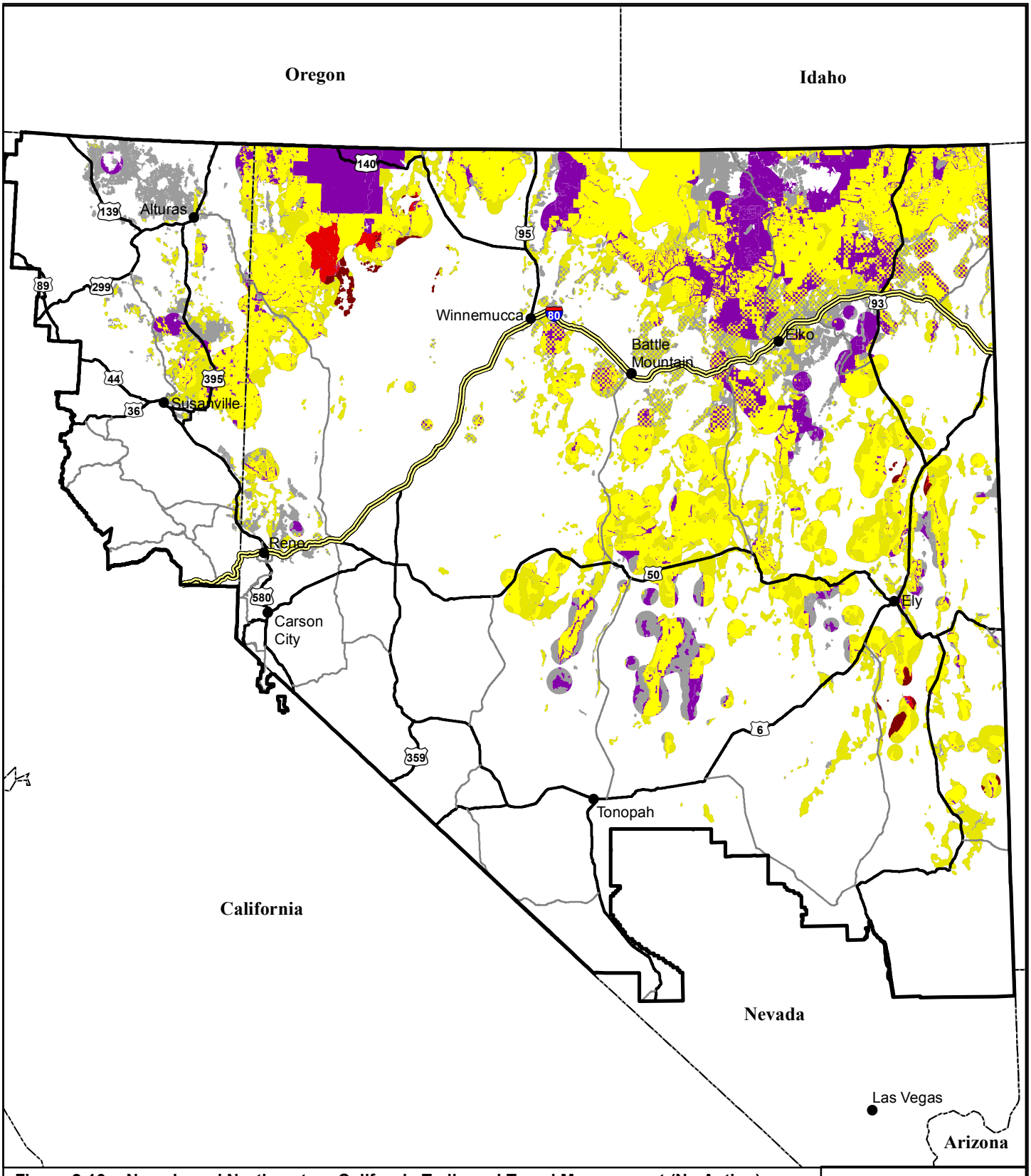


Figure 2-13a: Nevada and Northeastern California Trails and Travel Management (No Action)

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

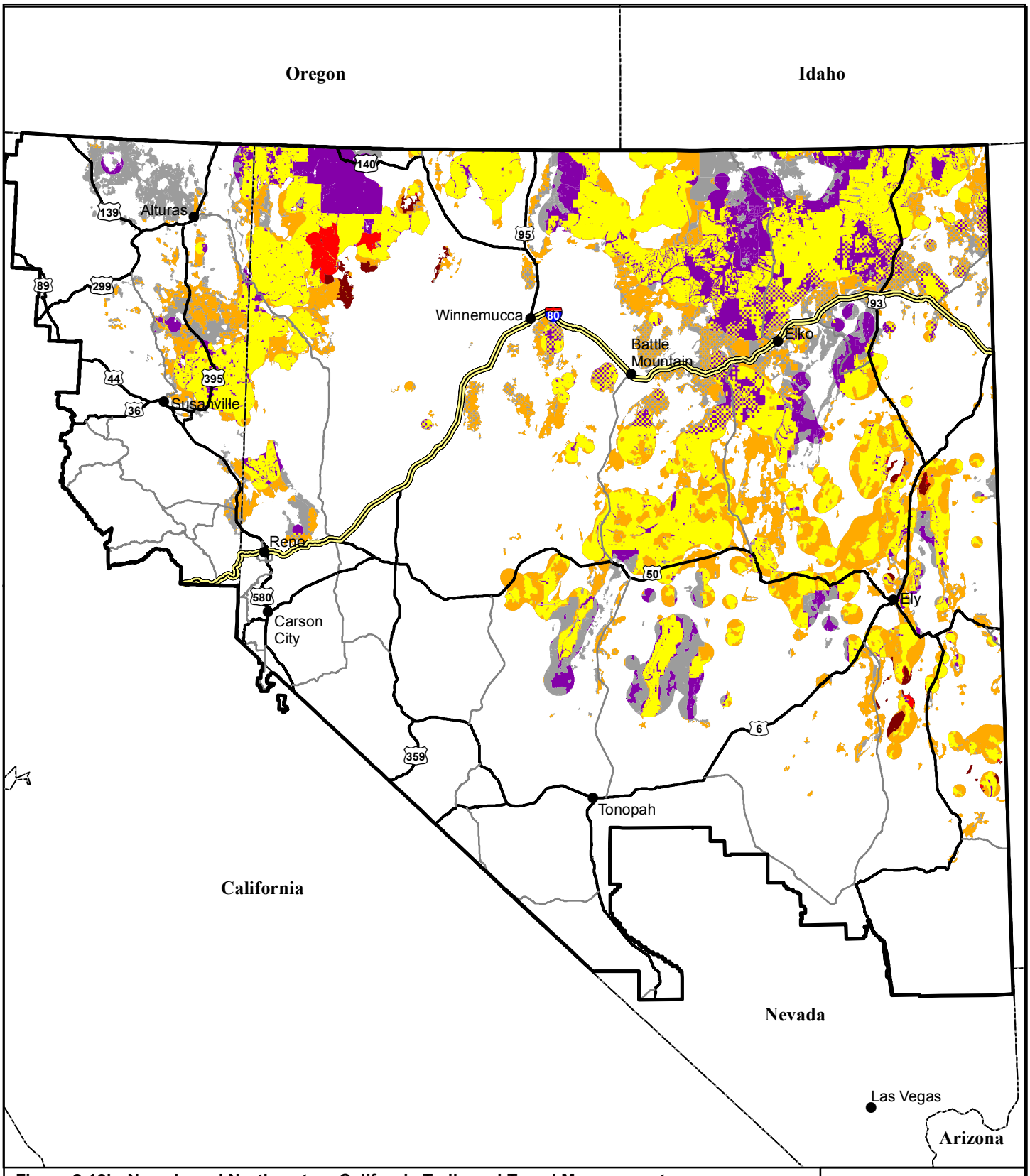


Figure 2-13b: Nevada and Northeastern California Trails and Travel Management (Management Alignment Alternative and Proposed Plan Amendment)

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

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Appendix B

Review of the NTT and COT Report's Relevance to the Planning Process; Incorporation of the NTT, COT, and USGS Summary of Science into the Nevada and California Planning Process

Appendix B. Review of the NTT and COT Report's Relevance to the Planning Process; Incorporation of the NTT, COT, and USGS Summary of Science into the Nevada and California Planning Process

B.1 BLM NATIONAL TECHNICAL TEAM REPORT (2011)

In 2010, the US Fish and Wildlife Service (USFWS) determined that Greater Sage-Grouse warranted listing under the Endangered Species Act, but was precluded from listing due to other priorities. In response to this determination, the BLM initiated a land use planning process in 2011. To help inform that process the BLM assembled a "National Technical Team" (NTT), comprising state and federal resource specialists and scientists to review the scientific literature available at that time. On December 21, 2011 the NTT finalized a document entitled *A Report on National Greater Sage-Grouse Conservation Measures*, also known as the National Technical Team Report (NTT Report). The report was developed to provide "the latest science and best biological judgement" from the available literature (NTT Report, Introduction, page 5). Though the NTT Report is not itself science, the NTT used the best science available at that time to inform the conservation measures it identified for BLM decision-makers to consider through the land use planning and NEPA process.

On December 27, 2011, the BLM issued policy in Instruction Memorandum 2012-044 requiring BLM offices to "consider all applicable conservation measures when revising or amending its RMPs in Greater Sage-Grouse habitat" (IM-2012-44, Policy/Action). The IM clarified a distinction between "all applicable conservation measures" and those included in the NTT Report by noting in the following sentence that "the conservation measures developed by the NTT…must be considered and analyzed, as appropriate, through the land use planning process" (ibid). Each BLM planning effort complied with this policy by including an alternative based entirely on the conservation measures identified by the NTT. This was Alternative B in the 2013 Draft EIS and 2015 Final EIS, and by extension in the 2018 Draft and Final EISs. Through this alternative and corresponding analysis, the BLM complied with its policy for considering the conservation measures in the NTT Report.

It is critical to clarify that neither the NTT nor the BLM's policy intended that the conservation measures in the NTT Report were to be automatically applied across the range without intervening consideration through detailed land use planning and NEPA analysis. In the same paragraph that directs the BLM to "consider all applicable conservation measures" from the NTT Report, IM-2012-044 also notes that "while these conservation measures are range-wide in scale, it is expected that at the regional and sub-regional planning scales there may be some adjustments of these conservation measures in order to address local ecological site variability." Moreover, the NTT understood that the measures in its report would be evaluated alongside competing land use planning considerations and with follow-up environmental analysis relating to the conservation efficacy of its measures. As the NTT Report described, the conservation measures are not themselves management decisions but rather have been prepared "to assist [the BLM] in making management decisions." (NTT Report, Introduction, page 5.) In

other words, "the conservation measures described in [the] report *are not an end point* but, rather, *a starting point* to be used in the BLM's planning processes" (ibid, page 5) (emphasis added).

The principle of local adaptation of scientific results and recommended conservation measures derived from them is present in other documents with Greater Sage-Grouse conservation recommendations. In 2014, three years after the NTT Report, the Department of the Interior requested the US Geological Survey (USGS) prepare a report that compiled and summarized published scientific studies regarding buffer distances around Greater Sage-Grouse habitats. In the report titled *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review* (Open File Report 2014-1239), USGS scientists note that "responses of individual birds and populations, coupled with variability in land-use patterns and habitat conditions, add variation in research results. This variability presents a challenge for land managers and planners seeking to use research results to guide management and plan for Greater Sage-Grouse conservation measures. Variability between Greater Sage-Grouse populations and their responses to different types of infrastructure can be substantial across the species' range. Logical and scientifically justifiable departures from the 'typical response,' based on local data and other factors, may be warranted when implementing buffer protections or density limits in parts of the species' range" (USGS Open File Report 2014-1239, page 2). A simple statement from the report indicates this variability, where the USGS scientists noted that "there is no single distance that is an appropriate buffer for all populations and habitats across the Greater Sage-Grouse range" (ibid, pg. 2).

Further, the BLM's policy requiring consideration of the conservation measures in the NTT Report allowed for individual planning efforts to make adjustments to the report's conservation measures. IM-2012-044 states that "the NTT-developed conservation measures were derived from goals and objectives developed by the NTT" and that "these goals and objectives are a *guiding philosophy* that should *inform* the goals and objectives developed for individual land use plans. However, *it is anticipated that individual plans may develop goals and objectives that differ and are specific to individual planning areas*" (emphasis added). The anticipation for variability across the range is even more explicit when the IM notes that "while [the NTT Report's] conservation measures are range-wide in scale, *it is expected* that at the regional and sub-regional planning scales there may be some adjustments of these conservation measures in order *to address local ecological site variability*" (emphasis added). With specific consideration of this variability, each BLM planning and NEPA effort developed and analyzed a range of alternative approaches for Greater Sage-Grouse habitat management in each sub-region/state. Through this process, the BLM considered local and regional differences, analyzing the effect of each alternative approach locally and cumulatively.

As the NTT developed its conservation measures, it did not take into consideration other legal and regulatory requirements associated with land use planning and NEPA. For example, the NTT's range-wide conservation measures did not take into account State or local Greater Sage-Grouse conservation efforts. In its foundational legislation for the BLM, Congress specifically declared that it neither enlarged nor diminished the authority of the states in managing fish and wildlife. In recognizing this role, as well as local knowledge and expertise, Congress directed the BLM to develop its land use plans to "be consistent with State and local plans to the maximum extent" (Federal Land Policy and Management Act {FLPMA}, Section 202 (c)(9)).

Other laws, regulations, and policies were not taken into account by the NTT as they developed their conservation measures. For example, the NTT Report's conservation measure that recommends that

priority Greater Sage-Grouse habitat areas be designated as unsuitable for all surface mining of coal entirely overlooks the specific process to determine unsuitability prescribed in 43 Code of Federal Regulations (CFR) 3461. Elsewhere the NTT Report states that "a 4-mile [no surface occupancy (NSO) stipulation] likely would not be practical given most leases are not large enough to accommodate a buffer of this size, and lek spacing within priority habitats is such that lek-based buffers may overlap and preclude all development" (NTT Report, page 21) and therefore presents a conservation measure to close priority Greater Sage-Grouse habitat areas to fluid mineral leasing. This is not consistent with BLM planning guidance directing planning teams that "when applying leasing restrictions, the least restrictive constraint to meet the resource protection objective should be used" (BLM-H-1601 Appendix C page 24); whether or not a lease is large enough to accommodate a large NSO should not be a consideration if NSO provides the necessary protection.

In recognition of instances where the NTT Report's conservation measures were not consistent with law, regulation, or policy, the BLM's policy direction in IM-2012-044 directs that "when considering the [NTT Report's] conservation measures…BLM offices should ensure that implementation of any of the measures is consistent with applicable statute and regulation. Where inconsistencies arise, BLM offices should consider the conservation measure(s) to the fullest extent consistent with such statute and regulation."

Each BLM planning effort fully considered the broad, range-wide recommendations from the NTT Report through the required NEPA process. This consideration was accomplished, as directed by Congress, using a "systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences" (FLPMA Section 202(c)(2)). Through careful consideration of the NTT's conservation measures, as well as local expertise, monitoring, partnerships, and other resource and land uses, the BLM developed Greater Sage-Grouse management goals, objectives, and management actions that accounted for the variability of habitat and resources across the range. Through the combination of both the 2015 and 2019 planning processes the BLM complied with the statutory requirement that the BLM resolve, "to the extent practical, inconsistencies between Federal and non-Federal Government plans" (FLPMA Sec. 202(c)(9)). Through these efforts, the BLM has met its statutory and regulatory responsibilities related to its consideration of the conservation measures contained in the NTT Report.

What the NTT Report and its Conservation Measures Are:

- The NTT Report included science-based management considerations for Greater Sage-Grouse to promote sustainable Greater Sage-Grouse populations.
- The conservation measures were to be considered and analyzed through the BLM's land use planning process.
- The conservation measures are range-wide in scale, not accounting for local variability.
- The conservation measures were a starting point to be used in the BLM's planning process.
- The NTT Report was developed by a team of resource specialists and scientists familiar with Greater Sage-Grouse literature and BLM programs.

What the NTT Report and its Conservation Measures Are Not:

- Unlike FLPMA's requirement that the BLM develop and modify Land Use Plans in coordination with state and local plans and policies, the NTT Report was not developed with input from or consideration of plans, policies, or programs of State, Tribal, or local government agencies.
- The conservation measures were not developed using a systematic interdisciplinary approach, as required by FLPMA for land use plans.
- The NTT Report presented conservation measures that would provide food and habitat for one species of wildlife, but did not consider other FLPMA requirements for BLM to manage for other species and resources while also recognizing the need for sources of minerals, food, timber and fiber from public lands.
- The NTT Report is not a land use plan, or an amendment or revision to a land use plan.
- The conservation measures were based on best available science at the time and do not provide for future updates in scientific knowledge or technological advancements.
- When preparing the NTT Report, the NTT did not complete a NEPA analysis on its conservation measures. Instead, the BLM completed NEPA and land use planning processes in 2015 and 2019 to assess the environmental consequences of the NTT Report's conservation measures, as well as alternatives to those measures—and to account for competing land management considerations.

B.2 US FISH AND WILDLIFE CONSERVATION OBJECTIVES TEAM REPORT (2013)

In 2012 the director of the USFWS convened a Conservation Objectives Team (COT) of state and USFWS representatives. The team developed a peer-reviewed report (COT Report) that delineated objectives based on the "best scientific and commercial data available at the time of its release" (COT Report, page ii). The COT Report, released in March 2013, identifies conservation objectives, measures, and options for each of the Greater Sage-Grouse threats assessed. The COT Report also identified Priority Areas for Conservation (PACs) which were identified as "the most important areas needed for maintaining Greater Sage-Grouse representation, redundancy, and resilience across the landscape" (ibid, page 13). Unique compared to the NTT Report, the COT Report identified threats to each PAC, recognizing that threats vary across the range, and therefore corresponding management should vary to address those threats. The preface to the report is clear that the COT report "is guidance only" and that the "identification of conservation objectives and measures does not create a legal obligation beyond existing legal requirements" (ibid, page ii). Further, the preface notes that the objectives "are subject to modification as dictated by new findings, changes in species' status, and the completion of conservation actions" (ibid, page ii).

The COT Report clearly identifies the necessity to adapt Greater Sage-Grouse conservation goals, objectives, and measures due to variability across the range. The COT noted that "due to the variability in ecological conditions and the nature of the threats across the range of the Greater Sage-Grouse, *developing detailed, prescriptive species or habitat actions is not possible at the range-wide scale*" (emphasis added) (COT Report, Section 5- Conservation Objectives, page 31). The COT Report summarizes the relationship between its range-wide conservation goals, objectives, and measures and the state-specific planning efforts, noting that "specific strategies or actions necessary to achieve the following conservation objectives must be developed and implemented at the state or local level, with the involvement of all stakeholders" (ibid).

The BLM received the COT Report when developing its 2013 Draft EIS and fully considered it prior to Draft EIS publication, providing for public review of the BLM's evaluation. Upon receipt of the Report the BLM evaluated the range of alternatives and determined that the threats addressed by the COT Report were all addressed in the range of alternatives; this was presented to the public in Appendix C in the 2013 Draft EIS. The BLM also evaluated the impacts to Greater Sage-Grouse from the alternatives and determined that the COT Report objectives were all addressed within the range of alternatives; this was presented to the public in the 2013 Draft EIS Chapter 2 Table 2.4 (Comparison of Alleviated Threats to GRSG in the Utah Sub-Region).

Following public comments and development of the 2015 Proposed Plan, Section 2.5 of the Final EIS updated the crosswalk between the USFWS threats and the BLM program areas, showing that all the threats for which the BLM has discretion were addressed. Section 2.11.7 notes that all conservation measures and objectives identified in the COT report were considered within the 2015 Final EIS range of alternatives. Finally, a table was added to the 2015 Final EIS Executive Summary that showed the management actions from the 2015 Proposed Plan that addressed the COT Report threats.

On October 2, 2015, the USFWS determined that "listing the Greater Sage-Grouse as a threatened or endangered species is not warranted…" (Federal Register Vol. 80, No. 191, 59936). One of the rationales for this determination was that "the new Federal land-management paradigm is established in 98 amended Federal Plans that reduce and minimize threats to the species in the most important habitat for the species" (ibid). Through this language, it is clear that the 2015 planning efforts incorporated the recommendations from the COT Report to a degree that met the report's goal of "long-term conservation of Greater Sage-Grouse and healthy sagebrush shrub and native perennial grass and forb communities by maintaining viable, connected, and well-distributed populations and habitats across their range, through threat amelioration, conservation of key habitats, and restoration activities" (COT Report, page 13).

What the COT Report and its Objectives, Measures and Options Are:

- The COT Report sought to identify reasonable objectives, based upon the best scientific and commercial data available at the time of its release, for the conservation and survival of Greater Sage-Grouse.
- The COT Report is guidance to federal land management agencies, state Greater Sage-Grouse teams, and others developing efforts to achieve conservation for Greater Sage-Grouse.
- The COT Report was clear that its objectives were subject to modification based on new findings, changes in species' status, and the completion of conservation actions.
- The COT Report was developed by a team of state and USFWS representatives selected by their respective state or agency.

What the COT Report and its Objectives, Measures and Options Are Not:

- The COT Report is not a recovery plan, conservation strategy, or conservation agreement.
- The COT Report did not include input from BLM biologists or BLM field staff familiar with local habitat conditions and threats.
- The COT Report is not itself science, but includes objectives, measures, and options that were developed based on science.

- The COT Report was not developed with input from the BLM, its managers, planners, wildlife program leads, or field biologists and as such includes objectives, measures and options that do not consider statutory, regulatory, or policy requirements.
- When preparing the COT Report, the USFWS did not complete a NEPA analysis on its conservation objectives, measures, and options. Instead, the BLM completed NEPA and land use planning processes in 2015 and 2019 to assess the environmental consequences of the COT Report conservation objectives, measures, and options, as well as alternatives to those objectives, measures, options—as they applied to the development of affected BLM land use planning decisions—while accounting for competing land management considerations.

B.3 EXCERPTS FROM THE NEVADA AND CALIFORNIA FEIS NOVEMBER 2018

- **Executive Summary**
  - **p. ES-5.** *Plan Maintenance* - Management Decisions SSS 2(D) and SSS 3(C) from the 2015 ARMPA/ROD have been clarified to resolve conflicting statements regarding how the BLM would "apply" lek buffers contained in the USGS "*Conservation Buffer Distance Estimates for Greater Sage-Grouse–A Review", Open File Report 2014-1239* (Mainer et al. 2014).
  - **p. ES-9.** The BLM continues to build upon the 2015 planning effort as envisioned in Secretarial Order (SO) 3353 by collaborating with states and stakeholders to improve compatibility between federal management plans and state plans and programs at the state level, while ensuring consistency with the BLM's multiple use mission and obligation to protect Greater Sage-Grouse habitat. This enhanced cooperation between the BLM and the states would lead to improved management and coordination with states across the range of Greater Sage-Grouse. These modifications include updating and making adjustments to HMAs and including language that would allow the BLM to update them through plan maintenance, when appropriate, based on the best available current science; removing SFA designations; incorporating new science into the adaptive management strategy and replacing predetermined hard trigger responses with a clear causal factor analysis process to determine the appropriate management responses and to address the decline in Greater Sage-Grouse populations and/or habitat; revising and simplifying an allocation exception process to allow for the consideration of projects within Greater Sage-Grouse HMAs provided they meet prescribed criteria; solidifying the BLM's commitment to use the most current version and future updated versions of the State of Nevada's Habitat Quantification Tool (HQT) to quantify disturbance calculations; and identifying that seasonal timing restrictions and modifying habitat objectives would be addressed in coordination with the US Geological Service (USGS), Nevada Division of Wildlife (NDOW), CDFW, and others.

- **<u>Chapter 1:</u> Purpose of and Need for Action**
  - **p. 1-2.** On March 29, 2017, the Secretary of the Interior (Secretary) issued Secretarial Order (SO) 3349, American Energy Independence, ordering DOI agencies to reexamine practices "to better balance conservation strategies and policies with the equally legitimate need of creating jobs for hard-working American families." On June 7, 2017, the Secretary issued SO 3353 with a purpose of enhancing cooperation among 11 western states and the BLM in managing and conserving Greater Sage-Grouse. SO 3353

directed an Interior Review Team, consisting of the BLM, USFWS, and US Geological Survey (USGS), to coordinate with the Sage-Grouse Task Force Team and review the 2015 Greater Sage-Grouse plans and associated policies to identify provisions that may require modification to make the plans more consistent with the individual state plans and better balance the BLM's multiple-use mission as directed by SO 3349. On August 4, 2017, the Interior Review Team submitted its "Report in Response to SO 3353." This report made recommendations for modifying the Greater Sage-Grouse plans and associated policies to better align with the individual state plans. On August 4, 2017, the Secretary issued a memo to the Deputy Secretary directing the BLM to implement the recommendations found in the report.

- **p. 1-6.** This RMPA/EIS would incorporate, as appropriate, information in a USGS report that identified and annotated Greater Sage-Grouse science published since January 2015 (Carter et al. 2018) and a report that synthesized and outlined the potential management implications of this new science (Hanser et al. 2018), and other best available science.
- **p. 1-10 - 11.** *Plan Maintenance* - Management Decisions SSS 2(D) and SSS 3(C) from the 2015 ARMPA/ROD have been clarified to resolve conflicting statements regarding how the BLM would "apply" lek buffers contained in the USGS Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review, Open File Report 2014-1239* (Mainer et al. 2014). Management Decisions SSS 2(D) and SSS 3(C) have been revised to read as follows:

  In undertaking BLM management actions [in PHMA and GHMA], and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM would utilize the lower end of the interpreted range of lek buffer-distances and guidance identified in Mainer et al. (2014) to establish the evaluation area around leks that would be used to analyze impacts during project-specific NEPA, including scientifically justifiable departures based on local data, topography, and other factors, in accordance with Appendix B.

  Appendix B has also been revised to reflect this clarified decision language.

- **Chapter 2: Alternatives**
  - **Section 2.2.1 Varying Constraints on Land Uses and Development Activities. p. 2-2.** Alternative B was based on the conservation measures developed by the National Technical Team planning effort in the Washington Office Instruction Memorandum (IM) 2012-044. As directed in the IM, the conservation measures developed by the National Technical Team must be considered and analyzed, as appropriate, through the land use planning process and NEPA by all BLM state and field offices that contain occupied Greater Sage-Grouse habitat. Most management actions included in Alternative B would have been applied to PHMA.
  - **Section 2.2.1 Varying Constraints on Land Uses and Development Activities. p. 2-2 - 3.** The Proposed LUPA incorporated guidance from specific State Conservation strategies, as well as additional management based on the National Technical Team recommendations. This alternative emphasized management of Greater Sage-Grouse seasonal habitats and maintaining habitat connectivity to support population objectives.

- **Section 2.2.1 Varying Constraints on Land Uses and Development Activities. p. 2-3.** Further, additional constraints on land uses or development without a documented need would not meet the purpose of SO 3353. The BLM did not discover new information that would indicate that it should increase the level of conservation, management, and protection to achieve its land use plan objective. As part of the consideration of whether to amend the 2015 ARMPA/ROD, the BLM partnered with the USGS to review the best available information published since January 2015, develop an annotated bibliography of that Greater Sage-Grouse science (Carter et al. 2018; see Section 3.1), and incorporate the information into this EIS. In addition, SO 3353 directs the BLM to promote habitat conservation, while contributing to economic growth and energy independence. As analyzed in the 2015 Final EIS, all of the previously analyzed alternatives, including one proposing constraints stricter than the current management plan, were predicted to result in a loss of development opportunities on public lands.
- **Section 2.4 Comparative Summary of Alternatives. p. 2-5.** Table 2-1 below provides a comparison between acres designated as PHMA, GHMA, and Other Habitat Management Areas (OHMA) (managed by the BLM) between the No-Action Alternative and Management Alignment Alternative. The change in acres between these two alternatives is based on the BLM's consideration in the Management Alignment Alternative of new PHMA, GHMA, and OHMA boundaries, from the composite management categories contained within the USGS's Spatially Explicit Modeling of Annual and Seasonal Habitat for Greater Sage-Grouse (*Centrocercus urophasianus*) in Nevada and Northeastern California—an updated decision-support tool for management (Coates et al. 2016) and as adopted and modified by the State of Nevada on December 11, 2015
- **Table 2-2 Comparison of Alternatives. p. 2-7 – 25.** USGS appears.

- **<u>Chapter 3:</u> Affected Environment**
  - **Section 3-1 Introduction. p. 3-1.** The BLM analyzed the management situation in full compliance with its regulations and policies. The BLM evaluated inventory and other data and information, partnering with USGS and coordinating extensively with States, to help provide a basis for formulating reasonable alternatives. The BLM described this process in its Report to the Secretary in response to SO 3353 (Aug. 4, 2017). Among other things, the Report describes how the BLM coordinated "with each State to gather information related to the [Secretary's] Order, including State-specific issues and potential options for actions with respect to the 2015 GRSG Plans and Instruction Memorandums (IMs) to identify opportunities to promote consistency with State plans." (Report to the Secretary at 3.) This process overlapped to some degree with the BLM's scoping process, which also assisted the BLM in identifying the scope of issues to be addressed and significant issues, and with coordination with the States occurring after the Report.
  - **Section 3.1.1 Greater Sage-Grouse Literature, 2015-2018. p. 3-2.** As part of the consideration of whether to amend some, all, or none of the 2015 Greater Sage-Grouse land use plans, the BLM requested the USGS to inform the effort through the development of an annotated bibliography of Greater Sage-Grouse science published

since January 2015 (Carter et al. 2018)[1] and a report that synthesized and outlined the potential management implications of this new science (Hanser et al. 2018).

Following the 2015 Final EIS, the scientific community has continued to improve the knowledge available to inform implementation of management actions and an overall understanding of Greater Sage-Grouse populations, their habitat requirements, and their response to human activity. The report discussed the science related to six major topics identified by USGS and BLM (summarized below), as follows:

- Multiscale habitat suitability (habitat objectives) and mapping tools
- Discrete human activities
- Diffuse activities
- Fire and invasive species
- Restoration effectiveness
- Population estimation and genetics

– **Section 3.1.1 Greater Sage-Grouse Literature, 2015-2018. p. 3-3.** Advances in modeling and mapping techniques at the range-wide scale can help inform broad-scale habitat assessment, allocations, and targeting of land management resources to benefit Greater Sage-Grouse conservation. The 2015 Final EIS included the 2014 version of the "Spatially explicit modeling of Greater Sage-Grouse (*Centrocercus urophasianus*) habitat in Nevada and northeastern California—A decision-support tool for management"-USGS Open-File Report 2014-1163 (Coates et al. 2014) to delineate Greater Sage-Grouse HMAs within the planning area.

In 2016, the USGS updated the 2014 decision support tool, as follows:

- Adding radio and global positioning system (GPS) telemetry locations from Greater Sage-Grouse monitored at multiple sites during 2014 to the original location dataset beginning in 1998
- Integrating high resolution maps of sagebrush and pinyon and/or juniper cover
- Modifying the spatial extent of the analyses to match newly available vegetation layers
- Accounting for differences in habitat availability between mesic sagebrush steppe communities in the northern part of the study area and drier Great Basin sagebrush in southerly regions
- Deriving updated land management categories and an updated index of Greater Sage-Grouse abundance and space-use
- Masking urban footprints and major roadways out of the final map products

Based on continued efforts to refine and improve Greater Sage-Grouse habitat mapping and incorporate the best available science, the BLM is considering adopting the updated 2016 spatially explicit model -USGS Open-File Report 2016-1080 (Coates et al. 2016), which was adopted by the State of Nevada and recommended for adoption by the State of California. Adoption of Coates et al. 2016 would allow the BLM to update delineations for Greater Sage-Grouse HMAs (PHMA, GHMA, and OHMA).

– **Section 3.3 Greater Sage-Grouse and its Habitat. p. 3-6.** Since 2015, the BLM and Forest Service have been implementing the Greater Sage-Grouse conservation measures outlined in the 2015 Final EIS. In addition to working with partners, such as

NDOW, CDFW, and USGS, to monitor the status of Greater Sage-Grouse populations in the planning area, the BLM has also been tracking human disturbance, wildland fire, and reclamation/restoration efforts in Greater Sage-Grouse HMAs.

- **Section 3.3.1 Greater Sage-Grouse Population Status. p. 3-7 – 8.** In a recent publication by USGS (Coates et al. 2017b), data from monitored Greater Sage-Grouse lek sites across Nevada and Northeastern California from 2000 to 2016 were used to estimate annual rates of change in Greater Sage-Grouse populations. As of 2016, populations across Nevada and northeastern California have declined at an average rate of 3.86 percent annually over the last 17 years. This estimated rate of population decline corresponds to other estimates documented for Greater Sage-Grouse in the Great Basin (Garton et al. 2011; Coates et al. 2016a).

- **Chapter 4: Environmental Consequences**

  - **Section 4.13.2 Why Use the WAFWA Management Zone? p. 4-26.** The cumulative effects analysis area for Greater Sage-Grouse extends beyond a state, political, or planning area boundary to reflect the WAFWA MZs because they encompass areas with similar issues, threats, and vegetative conditions important Greater Sage-Grouse habitat management. Each suite of threats to specific Greater Sage-Grouse populations have been identified in the USFWS's 2013 Conservation Objectives Team (COT) Report, the 2015 Regional RODs (BLM 2015c), and the USFWS' 2010 Listing Decision. The 2015 Regional RODs (BLM 2015c) identify how planning level allocation decisions address the identified threats to populations, which are aggregated in this analysis by MZs. The threats vary geographically and may have more or less impact on Greater Sage-Grouse and its habitat in some parts of the MZs, depending on such factors as climate, land use patterns, and topography.
  - **Section 4.4 Incomplete or Unavailable Information. p. 4-10.** The best available information pertinent to the decisions to be made was used in developing the 2015 Final EIS as well as this Proposed RMPA/Final EIS. The BLM made a considerable effort to acquire and convert resource data into digital format from the BLM and outside sources (e.g., NDOW, USGS, etc.).
  - **Section 4.5.2 Management Alignment Alternative. p. 4-11.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. This would ensure that current and future renditions of HMA boundaries accurately reflect Greater Sage-Grouse habitat on the ground and guide management actions appropriately. As the boundaries are updated, the land use plan allocations associated with each HMA (see Table 2-1) would be adjusted to match the newest USGS map model (Coates et al. 2016). This would help to conserve the species by ensuring allocations and any of their associated restrictions are applied in the appropriate areas, while allowing infrastructure and economic development to occur in areas that would not affect the species.
  - **Section 4.6.2 Management Alignment Alternative. p. 4-15.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically

revising these boundaries in the future, as new data becomes available. The allocations associated with each HMA (Table 2-2) would be adjusted based on updates to the USGS map model (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

- **Section 4.7.2 Management Alignment Alternative. p. 4-16 - 17.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (Table 2-2) would be adjusted to align with the USGS map model, as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet the prescribed criteria.
- **Section 4.8.2 Management Alignment Alternative. p. 4-17 – 18.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (Table 2-2) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.
- **Section 4.9.2 Management Alignment Alternative. p. 4-19.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (Table 2-2) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.
- **Section 4.10.2 Management Alignment Alternative. p. 4-20.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each habitat management area (Table 2-2) would be adjusted to align with USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within Greater Sage-Grouse HMA, provided they meet prescribed criteria.
- **Section 4.11.2 Management Alignment Alternative. p. 4-21.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each HMA (Table 2-2) would be adjusted to align with the USGS map model as updated (Coates et al. 2016). The allocation exception process

would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet prescribed criteria.

- **Section 4.12.2 Management Alignment Alternative. p. 4-22.** The Management Alignment Alternative proposes to update the HMA boundaries for PHMA, GHMA, and OHMA to reflect the best available science, and outlines a process for periodically revising these boundaries in the future, as new data becomes available. The land use plan allocations associated with each habitat management area (Table 2-2) would be adjusted to align with the USGS map model as updated (Coates et al. 2016). The allocation exception process would be updated and standardized, as described in Table 2-2, to allow for the consideration of projects within HMAs, provided they meet the prescribed criteria.
- **Section 4-13 Cumulative Effects Analysis. p. 4-23.** This Proposed RMPA/Final EIS incorporates by reference the analysis in the 2015 Final EIS and the 2016 SFA Draft EIS, which comprehensively analyzed the cumulative impacts associated with these planning decisions under consideration in that process. The 2015 Final EIS, and to some degree the 2016 SFA Draft EIS evaluated the cumulative impacts associated with the No-Action Alternative in this Proposed RMPA/Final EIS. The Management Alignment Alternative's and Proposed Plan Amendment's impacts are effectively within the range of effects analyzed by the 2015 Final and 2016 SFA Draft EISs. The 2015 Final EIS is quite recent, and the BLM has determined that conditions in the Nevada and Northeastern California Sub-region have not changed significantly based, in part, on the USGS science review (see Chapter 3), as well the BLM's review of additional past, present, and reasonably foreseeable actions in 2018. Conditions on public land have changed little since the 2015 Final EIS, and to the extent that there have been new actions or developments, the impacts associated with those actions or developments are in line with the projections in the 2015 Final EIS regarding reasonably foreseeable future actions and effects. Additionally, changes that have occurred on a smaller scale, like wildfires, received prompt responses. Since the nature and context of the cumulative effects scenario has not appreciably changed since 2015, and the 2015 analysis covered the entire range of the Greater Sage-Grouse, the BLM's consideration of cumulative effects in the 2015 Final EIS adequately addresses most, if not all, of the planning decisions to be made through this planning effort.
- **Section 4.13.1 Range-wide Cumulative Effects Analysis – Greater Sage-Grouse. p. 4-25.** The BLM's assessment that conditions and cumulative impacts have not changed significantly is based, in part, on the USGS science review (see Chapter 3) and the BLM's review of additional past, present, and reasonably foreseeable actions in 2018. Since the nature and context of the cumulative effects scenario have not appreciably changed since 2015, and the 2015 plans included analysis by WAFWA MZ across the entire range of the Greater Sage-Grouse, the cumulative effects analysis in the 2015 Final EIS applies to this planning effort and provides a foundation for the BLM to identify any additional cumulative impacts.

- **Chapter 5: Consultation and Coordination**
  - NTT, COT, and USGS do not appear
  - US Geological Survey appears in Table 5-1 (Cooperating Agencies)

- **Acronyms and Abbreviations**
  - USGS appears; NTT and COT do not appear
- **Appendix A: Maps**
  - NTT, COT, and USGS do not appear
- **Appendix B: Lek Buffer-Distances (Evaluating Impacts to Leks)**
  - USGS appears; NTT and COT do not appear
- **Appendix C: Required Design Features Worksheet**
  - NTT, COT, and USGS do not appear
- **Appendix D: Adaptive Management Plan**
  - USGS appears; NTT and COT do not appear
- **Appendix E: Fluid Mineral Stipulations, Waivers, Modifications, and Exceptions**
  - USGS appears; NTT and COT do not appear
- **Appendix G: Responses to Substantive Public Comments on the Draft EIS**
  - NTT, COT, and USGS appear
  - National Technical Team and Conservation Objectives Team appears
- **Appendix H: Cumulative Effects Supporting Information**
  - NTT, COT, and USGS do not appear
- **Dear Reader, Abstract, Chapter 6, Glossary, Index**
  - NTT, COT, and USGS do not appear
  - Conservation Objectives Team and US Geological Survey appears in Chapter 6 (References)

B.4 EXCERPTS FROM CHAPTER 2 NVCA FEIS JUNE 2015 FOR NTT AND COT:

Page	NTT	COT	USGS
2-1			**Changes to Chapter 2 between draft and final EIS:** • Developed separate BLM and Forest Service Proposed Plan Amendments • Added additional references to support the management decisions • Updated maps and habitat category acreages based on USGS-*A Spatially Explicit Modeling of Greater Sage-Grouse Habitat in Nevada and Northeastern California: A Decision Support Tool for Management (Coates et al. 2014) (see Appendix A)* • Updated Alternative E based on the State of Nevada's revised Greater Sage-Grouse Plan submitted during the public comment period • Updated Alternative language, as appropriate, based on public comments received on the Draft LUPA/EIS. • Chapter 2 has been reorganized for consistency between all sub-regional GRSG LUPAs/EISs. • The GRSG habitat objectives table has been updated. • See additional changes in Section 2.1
2-1			Changes made to the Proposed LUPA/Final EIS from the preferred alternative (Alternative D) in Draft LUPA/EIS are the following: • Revised GRSG map—Updated PHMA and GHMA delineations based on best available science, i.e., USGS Open File Report 2014-1163; delineated unmapped areas identified in the DEIS based on the USGS report. With the adoption of the USGS habitat suitability map (2014), the unmapped habitat is now mapped and identified in the Proposed LUPA/Final EIS as OHMA. A description of the mapping change was analyzed in the Draft LUPA/EIS and an explanation can be found in Appendix A (Habitat Mapping Process).

Page	NTT	COT	USGS
2-3			As noted in the DEIS, one of the goals/objectives of this planning effort is to protect both the habitat and the species. (see, for example, the LUPA/DEIS Goal B-SSS 1, Goal D-SSS 1, Goal E-SSS 1, Goal F-SSS 1, and Objective D-SSS 4. Further, as noted by the USGS Report/Coates which supports the delineation of habitat mapping for this planning effort, the potential presence of bird in these areas of the SFAs is acknowledged (see USGS Open File Report 2014-1163; page page28, habitat definitions).
2-3 - 4			USGS Buffer Study—Included a management action to incorporate the lek buffer-distances identified in the USGS report titled Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review: USGS Open File Report 2014-1239 (Manier et al. 2014) during NEPA analysis at the implementation stage. Although the buffer report was not available at the time of the DEIS release, applying these buffers was addressed in the DEIS and is qualitatively within the spectrum of alternatives analyzed. Specifically, (Alternatives C and F) identified and analyzed allocation restrictions such as closure to fluid minerals, recommendation for withdrawal, elimination of grazing. For example, Alternative C proposed closure to fluid, salable, and non-energy leasable minerals in all GRSG habitat. It also included elimination of grazing in all habitat. In Alternative C, all GRSG habitat was excluded for ROW development. Alternative D proposed exclusion for solar and wind development in PHMA and GHMA and proposed closures for salable and non-energy leasable minerals. Alternative F proposed closure to fluid and salable minerals in PHMA and GHMA. Alternative F also proposed exclusion areas in PHMA and GHMA for solar, wind and all ROWs.

Page	NTT	COT	USGS
2-6		The BLM and Forest Service developed this LUPA/EIS to provide management direction for over 55 million acres of land that they administer in the Great Basin. This Proposed LUPA/ Final EIS analyzes alternatives that address threats to GRSG habitat identified in the USFWS listing decision and COT report (USFWS 2010 and 2013a).	
2-10	Developed a No Action Alternative (Alternative A) and two preliminary action alternatives. The first, Alternative B, is based on A Report on National Greater Sage-Grouse Conservation Measures (NTT 2011), and the second, Alternative C, is based on a proposed alternative submitted by conservation groups.		
2-10	Customized the goals, objectives, and actions from the NTT-based Alternative B to develop a third action alternative, Alternative D, for balance among competing interests.		
2-11			The habitat nomenclature between the Draft LUPA/EIS and the Proposed LUPA/Final EIS has changed. The draft LUPA/EIS used the terms preliminary priority habitat (PPH) and preliminary general habitat (PGH) to describe GRSG habitat and as a basis for proposed management in the action alternatives. The Proposed LUPA/Final EIS uses the terms priority habitat management areas (PHMAs), general habitat management areas (GHMAs) and other management areas (OHMA). These areas are based on USGS (2014) habitat mapping, as described in Section 1.1.2, Nevada and Northeastern California Sub-regional Strategy, subsection- Habitat Delineation.

Page	NTT	COT	USGS
2-11 *(cont'd)*			Also, in the proposed plan, there is GRSG habitat mapped as other habitat management areas (OHMAs). This habitat was referenced in the Draft LUPA/EIS as unmapped habitat outside of PHMAs and GHMAs but in the planning area. With the adoption of the USGS habitat suitability map (2014), the unmapped habitat is now mapped and identified in the Proposed LUPA/Final EIS as OHMA.
2-12		Managing GRSG habitat in this document is focused on responding to the threats identified by the USFWS in its 2010 "warranted but precluded" finding on listing the GRSG, as well as its COT report (USFWS 2010 and 2013a). The USFWS threats do not necessarily align with BLM and Forest Service resource program areas, and they are often integrated into several different agency resource program areas. Table 2-1 provides a crosswalk between each of the 2010 warranted but precluded findings and COT-identified threats; the table compares these to the BLM and the Forest Service program areas addressing these threats, with references to the specific sections of the LUPA/Proposed Plan.	
2-16			The BLM and Forest Service Proposed Plan Amendment considers documents related to the conservation of GRSG that have been released since the publication of the Draft LUPA/EIS. For example, this Proposed Plan Amendment considers the USFWS's October 27, 2014, memorandum, Greater Sage-Grouse: Additional Recommendations to Refine Land Use Allocations in Highly Important Landscapes, and the USGSs' November 21, 2014, report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review (USGS 2014). Based on these documents, the BLM is proposing to designate SFAs to further protect highly valuable habitat. It is also proposing to include lek buffer-distances when authorizing activities near leks. The

Page	NTT	COT	USGS
2-16 *(cont'd)*			BLM and Forest Service also updated the Proposed Plan Amendment to reflect new GRSG state conservation strategies, including recent state executive orders.
2-18 - 19			Table 2-2 Proposed Habitat Objectives for GRSG. USGS appears.
2-22			In management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File-Report 2014-1239 (Manier et al. 2014), in accordance with Appendix B.
2-24			In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File Report 2014-1239 (Manier et.al 2014]), in accordance with Appendix B.
2-35		Action WFM-HFM 5: If prescribed fire is used in GRSG habitat, the NEPA analysis for the Burn Plan will address: • Why alternative techniques were not selected as a viable option • How GRSG goals and objectives would be met by its use • How the COT report objectives would be addressed and met • A risk assessment to address how potential threats to GRSG habitat would be minimized.	

Page	NTT	COT	USGS
2-76			The BLM and Forest Service cooperated with the Nevada SETT, NDOW, CDFW, and USFWS, along with GRSG research scientists from the USGS and the University of Nevada Reno in developing the adaptive management triggers, definitions, and methods of calculating population and habitat trends.
2-76			*Adaptive Management Application Scale and Reporting Units* The scale used to monitor for application of the adaptive management triggers are the Biological Significant Units (BSUs; **Map 2-1**) developed in collaboration with the Nevada SETT, NDOW, CDFW, and USGS. These areas represent local GRSG population use areas in the sub-region. The monitoring data on population and habitat can be aggregated up to the population, WAFWA management zone, or other reporting units, such as priority areas for conservation (PACs). Likewise, finer-scale management adjustments can be applied at the lek cluster-scale using population responses and triggers. The boundaries of the BSUs, lek clusters, and other reporting units may be adjusted over time, based on the understanding of local population interactions, genetic sampling and climate variation. Population monitoring methods may be updated based on new science and advances in technology (e.g., integrated population models).

Page	NTT	COT	USGS
2-79			***Population Trends for Triggers*** Counts of male GRSGs attending breeding leks provide reliable data for analyzing population growth trends (Fedy and Aldridge 2011). Lek counts can inform statistical estimation of population growth rates (see below) at each scale. "Trend leks" have been identified by NDOW, USGS and CDFW within each BSU. Trend leks are monitored consistently each year and have more available data than adjacent leks within the BSU. These trend leks will be used to estimate the population trends/averages within each BSU. Triggers for changes in population growth will be evaluated at three scales: individual lek (smallest scale), lek cluster, and BSU (largest scale).
2-82			The rate of GRSG population decline and the time frame over which populations are evaluated would be monitored and adjusted as understanding of GRSG population thresholds emerge. The BLM, Forest Service, NDOW, USGS, and CDFW would pursue a program to collect and incorporate additional demographic data into the GRSG space-use model.
2-89		In all GRSG habitat, in undertaking BLM/USFS management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Actions which result in habitat loss and degradation include those identified as threats which contribute to GRSG disturbance as identified by the US Fish and Wildlife Service in its 2010 listing decision (75 FR 13910), COT report (USFWS 2013a) and shown in Table 2 in the attached Monitoring Framework (Appendix E).	

Page	NTT	COT	USGS
2-94 - 95	GRSG conservation measures in A Report on National Greater Sage-Grouse Conservation Measures (NTT 2011) were used to form BLM and Forest Service management direction under Alternative B. Management actions by the BLM and Forest Service in concert with other federal, state, and local agencies, tribes, and private landowners play a critical role in the future trends of GRSG populations. To ensure BLM and Forest Service management actions are effective and based on the best available science, the BLM's National Policy Team created the National Technical Team in August 2011. The BLM's objective for chartering this planning strategy was to develop new or revised regulatory mechanisms, through LUPs, to conserve and restore GRSG and its habitat on BLM-administered and National Forest System lands on a range-wide basis over the long term. Conservation measures in the report are applied to GRSG PHMAs and to a lesser extent to GHMAs. The alternative includes all mapped PPH and PGH (Section 1.1.2) in PHMAs and GHMAs, with no adjustments. PHMAs have the highest conservation value to maintaining or increasing GRSG populations. The complete NTT report can be reviewed online at: https://www.blm.gov/sites/blm.gov/files/uploads/IM%202012-044%20Att%201.pdf. The BMPs proposed in the NTT report are included as RDFs (consistent with applicable law), as part of Alternative B and are listed in Appendix D of this document. Management actions from the NTT report		

Page	NTT	COT	USGS
2-94 – 95 *(cont'd)*	concerning coal are not applicable to the Nevada and Northeastern California Sub-region since there are no reasonably developable coal resources in the planning area. Accordingly, the part of the NTT report that addresses coal leasing was not carried forward as part of Alternative B.		
2-101			The desired conditions in Table 2-13 should not be reviewed, measured, or managed for, independently. GRSG habitat suitability should be determined by the relationship among several indicator values including ecological site descriptions (including current state and potential) along with the relative abundance of habitat types across the landscape. These conditions apply to an area being used by GRSG for the appropriate life stage (microsites) and not across the entire site or landscape. The desired conditions for each seasonal habitat should only be assessed during the appropriate season of use (dates can vary annually based on climatic conditions) and in areas spatially mapped as the relevant seasonal habitat (expected from USGS in May 2015).
2-102 - 103			Table 2-13 Desired Habitat Conditions for Greater Sage-Grouse. USGS appears.
2-104			These desired habitat conditions were developed by a team consisting of representatives from the USFWS, NDOW, USFS, USGS, and BLM. The team reviewed the Connelly et al. (2000) guidelines adding considerable detail and making adjustments based on regionally and locally derived data and analysis by the USGS. The State of Nevada's Science Work Group provided input on the science behind the desired habitat conditions in Table 2-13.
2-182 – 456			Table 2-16 Description of Action Alternatives. NTT appears.

Page	NTT	COT	USGS
2-203			Action E-SSS-ACDM 2: Determination of GRSG habitat will be based on the USGS Habitat Suitability Map (Figure XX). At the onset of a proposed project, habitat evaluations or "ground-truthing" of the project site and its surrounding areas shall be conducted by a qualified biologist with GRSG experience using methods as defined in Stiver et al (2010) to confirm habitat type. Evaluations can be conducted by the SETT or NDOW at the request of the project proponent.
2-461 – 488			Table 2-17 Summary of Environmental Consequences. NTT appears.

- End of tables of excerpts from the NVCA Greater Sage-Grouse 2015 FEIS and 2018 FEIS

B.5 COT, NTT AND USGS 2018 GENERAL INFORMATION

Outline:

1) COT and NTT Reports
    a) Introduction
    b) Description of each document
    c) How the reports were considered in 2015 and 2019 LUP decision
    d) How/which parts were implemented
2) USGS 2018 Annotated Bibliography: Research on Greater Sage-Grouse since 2015
    a) Description
    b) How it was considered in 2018

1.a. Introduction to COT and NTT reports:

Upon review of the best available science and commercial information, the USFWS concluded in 2010 that the Greater Sage-Grouse warranted protection under the ESA. Two factors leading to the decision to list the species as "warranted but precluded" were threats to habitat and the inadequacy of existing regulatory mechanisms.

1.b.i. Sage-Grouse National Technical Team (NTT). A Report on National Greater Sage-Grouse Conservation Measures. December 2011. https://eplanning.blm.gov/epl-front-office/projects/lup/9153/39961/41912/WySG_Tech-Team-Report-Conservation-Measure_2011.pdf

In 2011, in response to the USFWS 2010 warranted but precluded finding, the BLM initiated a land use planning process and assembled a National Technical Team (NTT) made up of state and federal Greater Sage-Grouse experts to review all of the best available science on Greater Sage-Grouse and habitat impacts and make recommendations for conservation measures that should apply inside Priority Habitats. The report describes the scientific basis for the conservation measures proposed within each BLM program area.

Among the key recommendations of the National Technical Team's final report (NTT 2011) were recommendations to: (1) close Priority Habitats to future mining claims and leasing for oil, gas, and coal; (2) apply four-mile NSO buffers around Greater Sage-Grouse leks for existing oil and gas leases; and (3) cap cumulative habitat disturbance at 3% of the landscape and one industrial site per square-mile.

1.b.ii. Conservation Objectives Team (COT). Greater Sage-Grouse Final Report. February 2013. https://www.fws.gov/greatersagegrouse/documents/COT-Report-with-Dear-Interested-Reader-Letter.pdf

In 2012, at the request of the Sage-Grouse Task Force, a group of state and federal representatives (Conservation Objectives Team (COT)) produced a report that identified the most significant areas for Greater Sage-Grouse conservation (Priority Areas for Conservation (PACs)), the principal threats within those areas, and the degree to which such threats need to be reduced or ameliorated to conserve the Greater Sage-Grouse so that it would not be in danger of extinction or likely to become so in the foreseeable future.

1.c. How COT and NTT were considered in 2015 and 2019 LUP decisions:

2015: As directed in the BLM Washington Office IM 2012-044, the conservation measures developed by the National Technical Team were to be considered and analyzed, as appropriate, through the land use planning and NEPA processes by all BLM state and field offices that contain occupied Greater Sage-Grouse habitat. IM 2012-144 https://www.blm.gov/policy/im-2012-044 also directed the BLM to refine the Preliminary Priority Habitat and Preliminary General Habitat data through the land use planning

process. The 2013 Draft Greater Sage-Grouse RMP amendments and revisions/Draft EISs contained one alternative based on the conservation measures developed by the National Technical Team and evaluated through the 2012-2015 planning process. (NOTE – do we need to mention that the COT Report was published in February and the draft EISs were published in August?)

2019: The BLM considered the entire range of alternatives from the 2015 Final EIS to identify issues meriting reconsideration, given the BLM's goal of enhancing alignment with state plans. In this manner, the BLM will continue to appropriately manage Greater Sage-Grouse and its habitat through this planning effort in tandem with the 2015 ROD/ARMPA.

1.d. How/which parts of NTT were implemented (does this mean – incorporated into the 2015 ROD?):
The 2015 Proposed LUPA incorporated management based on the National Technical Team recommendations.

2 USGS 2018 Annotated Bibliography: Research on Greater Sage-Grouse since 2015
2.a. Description:
In June 2017, Secretarial Order 3353 Greater Sage-Grouse Conservation and Cooperation with Western States established a team to review the federal land management agencies' Greater Sage-Grouse Plan Amendments or Revisions completed on or before September 2015.
https://www.doi.gov/sites/doi.gov/files/uploads/so_3353.pdf

In 2018, additional constraints on land uses or development without a documented need would not meet the purpose of SO 3353. The BLM did not discover new information that would indicate the agency should increase the level of conservation, management, and protection to achieve its land use plan objective. As part of the consideration of whether to amend the 2015 Greater Sage-Grouse RMPs, the BLM requested the USGS to develop an annotated bibliography of Greater Sage-Grouse science published since January 2015 (Carter et al. 2018; see Section 3.1). In addition, SO 3353 directs the BLM to promote habitat conservation, while contributing to economic growth and energy independence. As analyzed in the 2015 Final EIS, all the previously analyzed alternatives, including one proposing constraints stricter than the current management plan, were predicted to result in a loss of development opportunities on public lands.

2.b. How USGS Bibliography was considered in 2018
As part of the consideration of whether to amend some, all, or none of the 2015 Greater Sage-Grouse land use plans, the BLM requested the USGS to develop an annotated bibliography of Greater Sage-Grouse science published since January 2015 (Carter et al. 2018)1 and a report that synthesizes and outlines the potential management implications of this new science (Hanser et al. 2018).

B.6 How the 2019 ARMPA Changes Affect Alignment with USFWS Conservation Objectives Team Objectives

This appendix includes a description of the 2013 USFWS Conservation Objectives Team (COT) Report (USFWS 2013), including how the 2013 Draft EIS and 2015 Final EIS included sections that documented how the report's objectives were addressed in the range of alternatives. The October 2, 2015 USFWS determination that listing Greater Sage-Grouse as threatened or endangered was partially based on the 2015 ARMPAs incorporating management that reduced or minimized threats. This section summarizes an assessment of how the 2019 ARMPA management changes affect alignment with the COT Report

objectives. Based on this assessment, the management in the Nevada and Northeastern California Greater Sage-Grouse 2019 ROD/ARMPA does not change alignment with the COT objectives and the corresponding support of the COT Report's goal of "long-term conservation of Greater Sage-Grouse and healthy sagebrush shrub and native perennial grass and forb communities by maintaining viable, connected, and well-distributed populations and habitats across their range, through threat amelioration, conservation of key habitats, and restoration activities" (USFWS 2013; page 13).

B.6.1 Issue: Habitat Management Area Designations

The COT Report anticipated updating boundaries with the objective that "PAC boundaries should be adjusted based on new information regarding habitat suitability and refined mapping techniques, new genetic connectivity information, and new or updated information on seasonal range delineation" (USFWS 2013, page 37). Language was already in the 2015 ROD/ARMPA addressing such adjustments. The 2019 ROD/ARMPA added additional detail to clarify HMA boundary adjustments through the process of collecting and incorporating new information and adopting USGS' updated "Spatially Explicit Modeling of Annual and Seasonal Habitat for Greater Sage-Grouse (*Centrocercus urophasianus*) in Nevada and Northeastern California—an updated decision-support tool for management" (Coates et al. 2016). Additional detail on this is included in the 2018 Final EIS, Section 2.3. These additions in the 2019 ROD/ARMPA are consistent with the COT objectives.

B.6.2 Issue: Removal of Sagebrush Focal Areas

Removal of the SFAs does not affect meeting the COT objectives. SFAs were not identified as required to meet any specific COT objective and are not mentioned in the COT Report. The 2019 ROD/ARMPA continues to manage all SFAs according to their underlying Habitat Management Area (HMA) designation with the associated goals, objectives, and protective management. Removing the SFA recommendation for withdrawal from locatable mineral entry does not change impacts to HMAs, as there is low potential for such development, and therefore no threat to Greater Sage-Grouse or its habitat from mining in the SFAs (see 2016 Draft EIS). Further, prioritizing grazing permit renewals and vegetation treatments within SFAs over all other HMAs could have re-directed limited staff time and funding to areas that already provide functioning Greater Sage-Grouse habitat characteristics and away from areas that may have substantial resource concerns, potentially resulting in decreased habitat quality and quantity.

B.6.3 Issue: Allocation Exception Process

The 2015 ROD/ARMPA identified a unique allocation exception process for each of the following resources: Geothermal, Oil and Gas, Wind Energy, Recreation, Saleable Minerals and Land Tenure. The 2019 ROD/ARMPA revised these allocation exception processes by developing one consolidated process applicable to all of the resources listed above. The 2019 ROD/ARMPA provided consistency to the various exception allocation processes identified in the 2015 ROD/ARMPA, allows for verification of landscape-scale mapping of priority habitat management area (PHMA), general habitat management area (GHMA), and other habitat management areas (OHMA) in regards to the application of allocations and stipulations, addresses restrictions on actions related to public health and safety, existing infrastructure, and administrative functions and addresses inconsistencies with existing federal legislation that includes land tenure adjustments.

The COT objective for energy development states that it "should be designed to ensure that it will not impinge upon stable or increasing Greater Sage-Grouse population trends" (USFWS 2013, page 43). It

goes on to note that "addressing energy development and any subsequent successful restoration activities in sagebrush ecosystems *will require consideration of local ecological conditions*, which cannot be prescribed on a range-wide level."

For recreation development the COT object states: "In areas subjected to recreational activities, maintain healthy native sagebrush communities based on local ecological conditions and with consideration of drought conditions, and manage direct and indirect human disturbance (including noise) to avoid interruption of normal sage-grouse behavior."

The 2019 ROD/ARMPA defines specific criteria that must be met in order for an exception or modification to be considered (see MD SSS 5), including the following:

In PHMA, GHMA, and OHMA, the State Director may grant an exception to the allocations and stipulations described in Table 2-1 (Comparative Summary of Alternatives) if one of the following applies (in coordination with NDOW, SETT, and/or CDFW):

i. The location of the proposed activity is determined to be unsuitable (by a biologist with Greater Sage-Grouse experience using methods such as Stiver et al. 2015) and lacks the ecological potential to become marginal or suitable habitat; and will not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat. Management allocation decisions will not apply to those areas determined to be unsuitable if the area has passed a threshold and lacks the ecological potential to become marginal or suitable habitat.
ii. The proposed activities impacts will be offset to result in no adverse impacts on Greater Sage-Grouse or its habitat, through use of the mitigation hierarchy and the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law). In cases where exceptions may be granted for projects with a residual impact, voluntary compensatory mitigation consistent with the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law) will be one mechanism by which a proponent achieves the Approved RMPA goals, objectives, and exception criteria. When a proponent volunteers compensatory mitigation as their chosen approach to address residual impacts, the BLM will incorporate those actions into the rationale used to grant an exception. The final decision to grant a waiver, exception, or modification will be based, in part, on criteria consistent with the State's Greater Sage-Grouse management plans and policies.
iii. The proposed activity will be authorized to address public health and safety concerns, specifically as they relate to federal, state, local government and national priorities.
iv. Renewals or re-authorizations of existing infrastructure in previously disturbed sites or expansions of existing infrastructure that do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat.
v. The proposed activity is determined to be a routine administrative function conducted by federal, state or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e., rights-of-way for roads) that serve a public purpose and will have no adverse impacts on Greater Sage-Grouse and its habitat, consistent with the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).

Exceptions to non-disposal or exchange of lands that are identified for retention in Appendix A, Figure 2-12 could be considered if (a) they are identified for disposal through previous planning efforts or address a Congressional Act (e.g., the respective Lincoln and White Pine County Conservation, Recreation, and Development Acts), (b) the agency can demonstrate that the disposal, including land exchanges, will have no adverse direct, indirect or cumulative impacts on Greater Sage-Grouse and its habitat, or (c) adverse impacts on Greater Sage-Grouse or its habitat will be offset, through use of voluntary compensatory mitigation, consistent with the States' mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).

The Allocation Exception Process makes all exceptions to stipulations and land use plan allocations tied to PHMA, GHMA, and OHMA consistent and based on a set of six criteria and all exception need to be approved by the BLM State Directors.

B.6.4 Issue: Seasonal Timing Restrictions

Seasonal Timing Restrictions were not identified as required to meet any of the COT objectives and are not mentioned in the COT Report. The 2015 ROD/ARMPA included criteria for modifications and/or waivers to seasonal timing restrictions. The 2019 ROD/ARMPA revised the 2015 criteria to allow for beneficial Greater Sage-Grouse projects to be implemented to protect and enhance their habitat while avoiding negative impacts to Greater Sage-Grouse and its habitat.

The 2019 ROD/ARMPA includes the following criteria for applying modifications and waivers to seasonal timing restrictions:

The seasonal dates could be modified or waived (in coordination with NDOW and/or CDFW) based on site-specific information that indicates:

i. A project proposal's NEPA document and/or project record, and correspondence from NDOW and/or CDFW demonstrates that any modification (shortening/extending seasonal timeframes or waiving the seasonal timing restrictions altogether) is justified on the basis that it serves to better protect or enhance Greater Sage-Grouse and its habitat than if the seasonal timing restrictions are implemented. Under this scenario modifications can occur if:
    a. A proposed activity will have beneficial or neutral impacts on Greater Sage-Grouse.
    b. Topography or other factors eliminate direct and indirect impacts from visibility and audibility to Greater Sage-Grouse and its habitat.
    c. There are documented local variations (e.g., higher/lower elevations) and/or annual climatic fluctuations (e.g., early/late spring, long/heavy winter) that indicate the seasonal Life cycle periods are different than presented, or that Greater Sage-Grouse are not using the area during a given seasonal life cycle period.
ii. Modifications are needed to address an immediate public health and safety concern in a timely manner (e.g., maintaining a road impacted by flooding).
iii. The proposed action is determined to be a routine administrative function conducted by federal, state or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e., rights-of-way for roads) that serve a public purpose and will have no adverse impacts on Greater Sage-Grouse or its habitat.

Add a final paragraph stating since it was not in the COT it is in compliance and avoids impact to Greater Sage-Grouse and benefits Greater Sage-Grouse.

B.6.5 Issue: Adaptive Management

The COT Report recommends developing and implementing a monitoring plan to track the success of conservation plans. It notes that "without this information… there is no capacity to adapt if current management actions are determined to be ineffective" (COT Report; pg. 35). The COT Report suggested development and implementation of adaptive management actions "if the monitoring determines that current management actions are ineffective" (COT Report; page 35). However, the COT Report did not identify any specific criteria to monitor or recommend any management responses.

Consistent with COT recommendations, the 2015 ARMPA included an adaptive management approach complete with specific triggers and responses (see 2015 ROD/ARMPA; GRSG-AM-ST-011 and GRSG-AM-ST-012 and Appendix J). The 2019 ARMPA carried this strategy forward with several adjustments based on lessons-learned from implementing the 2015 strategy.

From the 2015 Plan:

A biologically significant unit (BSU) (see Appendix A; Figure 2-2) that has hit a soft trigger due to vegetation disturbance will be a priority for restoration treatments consistent with Fire and Invasives Assessment Tool (FIAT) (Appendix J).

If a soft trigger is reached, the BLM will identify the causal factor and apply additional project-level adaptive management and/or mitigation measures contained in the authorization (and for future similar authorizations), to alleviate the specific or presumptive causes in the decline of Greater Sage-Grouse populations or its habitats and include the following: The adjustment in management would be based on the causal factor and would affect only the area being impacted in the lek cluster or other appropriate scale (e.g., BSU)

- Greater Sage-Grouse populations and habitat would continue to be monitored annually.
- If the causal factor were not readily discernible, then an interdisciplinary team, including the BLM, Forest Service (as applicable), and state wildlife agency representatives, would identify the appropriate mitigation or adjusted management actions in a timely manner.

Once a hard trigger has been reached, all responses in Table J-1 and Table J-2 in Appendix J will be implemented. This includes where soft triggers have been reached for both population and habitat.

When a hard trigger is hit in a PAC that has multiple BSUs, including those that cross state lines, the WAFWA Management Zone Greater Sage-Grouse Conservation Team will convene to determine the cause, will put project level responses in place, as appropriate, and will discuss further appropriate actions to be applied. The team will also investigate the status of the hard triggers in other BSUs in the PAC and will invoke the appropriate plan response. Adopting any further actions at the plan level may require initiating a plan amendment process.

The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.

From the 2019 Plan:

The BLM will implement the Adaptive Management Strategy as described in Appendix D. The revised soft and hard population triggers, warnings, and new BSU and lek cluster boundaries were derived from USGS's *Hierarchical Population Monitoring of Greater Sage-Grouse (Centrocercus urophasianus) in Nevada and California— Identifying Populations for Management at the Appropriate Spatial Scale: US Geological Survey Open-File Report 2017– 1089* (Coates et al. 2017). These triggers, warnings, BSU boundaries, and lek cluster boundaries can be found in Appendix D. Soft and hard trigger responses will be removed when the criteria for recovery have been met (see Appendix D, Longevity of Responses). Removal of the soft and hard trigger responses returns management direction in the affected lek cluster and/or BSU to the management directions that were in place prior to reaching a trigger.

The 2015 ARMPA required a knee-jerk response, broadly applying suggested management changes before determining if those changes even related to the cause of the declines. The 2019 ARMPA provides for a more responsive approach, as suggested by the COT Report language. It revises the Adaptive Management Strategy to include the best available science and to better align with the State of Nevada's Adaptive Management Strategy (2018) which includes:

- Updates biologically significant units (BSU), lek cluster boundaries, as well as the state-space model to determine Greater Sage-Grouse population triggers (Coates et. Al 2017)
- Incorporated language regarding the longevity of soft and hard trigger responses.
- Removes all predetermined hard trigger responses which are replaced with a clear causal factor analysis process in collaboration with other Federal, state, and local partners.

Triggers are not specific to any particular project, but identify Greater Sage-Grouse population and habitat thresholds outside of natural fluctuations or variations (with the exception of wildfires) and are based on the two key metrics that are being monitored; population status and habitat loss. Reaching a trigger would initiate a local-state-federal interagency dialogue in collaboration with affected authorized land users to evaluate causal factor(s) and recommend adjustments to implementation-level activities to reverse the trend. BLM would strive to use a collaborative process with stakeholders, appropriate state and local agencies, and affected authorized land users when developing and implementing management responses when a trigger has been identified. This approach is consistent with the COT Report's language that recommends monitoring data be gathered to help guide management changes.

These changes in the 2019 ARMPA are consistent with the COT Report's language of adjusting management in direct response to collection and evaluation of monitoring data.

B.6.6 Issue: Compensatory Mitigation

The COT Report recommends the pursuit of a "no net loss" goal for sage-grouse habitat, noting that "when avoidance is not possible, meaningful minimization and mitigation of the impacts should be implemented" (page 31). It also recommends that "efforts should be made to restore the components lost within the PAC (e.g., redundancy or representation) in other areas such that there is no net loss of sage-grouse or their habitats" (page 37). The 2019 ARMPA implements this recommendation by adopting a goal and objective to "undertake planning decisions, actions and authorizations 'to minimize or eliminate threats affecting the status of [GRSG] or to improve the condition of [GRSG] habitat'" (2019 ARMPA; pg 1-5).

The COT Report does not specify how to achieve its objective of "no net loss" of sage-grouse habitat. The approach taken by the BLM in the 2019 ARMPA, which includes the goal and objective described above (Objective SSS-4, see also MD-SSS-2). while relying on avoidance and minimization, implementation of state mitigation requirements and standards, and voluntary mitigation undertaken by project proponents, as well as additional BLM and State investments to protect and restore sage-grouse habitat, is fully consistent with the COT report's recommendation to pursue a "no net loss" objective for sage-grouse habitat.

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Appendix C

Responses to Substantive Public Comments on the Draft EIS

Appendix C. Responses to Substantive Public Comments on the Draft EIS

This appendix is split up into four sections: Rangewide Comment Responses; Nevada and Northwest California-Specific Comment Responses; Rangewide Comments; and Nevada and Northwest California-Specific Comments. The Rangewide Comment Responses section contains a summary of comments received that apply mostly rangewide. The BLM recognizes that not all of these comments apply to all states, but they do apply across multiple states. This section also contains a response to the summaries of comments. The Nevada and Northwest California-Specific Comment Responses section contains a summary of comments received specific to Nevada and Northwest California and responses to those comments. The full text of parsed comments received both rangewide and Nevada and Northwest California-specific can be found in the respective sections.

C.1 Rangewide Comment Responses

C.1.1 Adaptive Management

Summary: The "hard" and "soft" triggers identified in the 2015 plan amendments should be maintained in the current planning amendments.

Response: BLM is focused on aligning its management with the states. BLM's stated purpose and *need* is to promote consistency and alignment with each State's management for Greater Sage-Grouse. The adaptive management triggers have been maintained. However, they have been modified to align with the State's management for Greater Sage-Grouse and with consideration for local circumstances. See individual state plans for the modified adaptive management.

Summary: Priority Habitat Management Area (PHMA) should be expanded to include additional areas.

Response: BLM is focused on aligning its management with the states. BLM's stated purpose and need is to promote consistency and alignment with each State's management for Greater Sage-Grouse. The habitat areas identified in the Draft RMPAs are based, in part, on the information provided by the State agencies and the latest available science and information regarding habitat for GRSG. The habitat designations in the plans can be modified based on established criteria to address habitat changes, new information, and site-specific conditions. Core area and winter habitat needs to coordinate response with Wyoming.

C.1.2 Alternatives - Other

Summary: West Nile virus is a material threat to sage-grouse, and retention ponds and infiltration ponds contribute to this risk.

Response: Where West Nile virus has been identified as a threat, the 2015 plans identified required design features specifically designed to reduce the risk of West Nile Virus. Further analyzing impacts of West Nile are outside the scope and do not meet the purpose and need of the 2018 plan amendment.

C.1.3 Assumptions and Methodology

Summary: The analysis assumes that there are sufficient resources to implement the plan, which is not a supported assumption. The analysis makes unrealistic assumptions about the capacity for restoration.

Response: Department workforce reduction actions are speculative at this time and not specific to BLM or GRSG related staff. To date the BLM has treated 1,505,326 acres; 1,159,247 of those acres since 2015. Further, specific Congressional appropriations have provided the funds allowing the BLM to treat more acres every fiscal year, highlighting both Congressional and the BLM's commitment to GRSG conservation. BLM is committed to the continued implementation of sage-grouse habitat and sagebrush steppe management.

Summary: The analysis assumes that project-level activities will undergo additional environmental review, but the use of Categorical Exclusions (CXs) and Determinations of NEPA Adequacy contradicts this assumption.

Response: If additional project level analysis is needed the BLM will conduct it at the appropriate stage. If the existing NEPA relevant to future actions is sufficient to support the decision maker, the BLM will document this in a Determination of NEPA Adequacy. If an action is categorically excluded and no extraordinary circumstances are present, the BLM expects to use a Categorical Exclusion. The list of DOI and BLM Categorical Exclusions is included in Appendices 3 and 4 of the BLM NEPA Handbook (H-1790-1). In addition, Section 390 of the Energy Policy Act of 2005 established five statutory Categorical Exclusions that apply only to oil and gas exploration and development pursuant to the Mineral Leasing Act.

Summary: The analysis assumes impacts will primarily occur on federal lands, but there is research that suggests otherwise.

Response: The decisions in the RMPAs apply only to BLM-administered lands and federal mineral estate. To the extent that these decisions affect non-BLM-administered lands, the effects are disclosed in the EIS. However, much of the direct and indirect effects of the decisions are confined to BLM-administered lands and federal mineral estate.

Summary: The analysis assumes use of best available science, but key studies are missing.

Response: The BLM coordinated with states, federal agencies and cooperating agencies to identify how the affected environment for sage-grouse management has changed. BLM specifically partnered with USGS to review the best available information published between January 2015 and January 2018 and incorporate the management implications of that information into this EIS. The report from USGS is available at https://pubs.er.usgs.gov/publication/ofr20181017 and referenced throughout the EIS. Please review the Data and Science response in this section for more information.

C.1.4 Cumulative Impacts

Summary: Because the scope of the current amendments isn't narrower than the 2015 amendments, tiering isn't appropriate. Incorporation of the Cumulative Effects Analysis (CEA) by reference is allowable, but the summary of the CEA is insufficient as written.

Response: BLM is using incorporation by reference, not tiering, to streamline our analysis consistent with Administrative priorities. Incorporation of the 2015 EIS by reference is allowable under BLM regulations and is appropriate in this circumstance because the purpose of this action builds upon the goals and objectives of the 2015 EIS.

Summary: The incorporation by reference of the 2015 CEA impedes public review.

Response: BLM is adding quantitative analysis of the cumulative impacts from planning decisions for each management zone to the Final EISs to address rangewide issues and trends.

Summary: The CEA failed to account for a number of relevant activities, such as oil and gas projects in Wyoming and other scheduled lease sales.

Response: The BLM will update the past, present, and reasonably foreseeable actions as needed to reflect all current projects in the Final EIS.

C.1.5 Data and Science

Summary: The public submitted studies for consideration by the BLM.

Response: BLM specifically partnered with USGS to review the best available information and incorporate the management implications of that information into this EIS. The report from USGS is available at https://pubs.er.usgs.gov/publication/ofr20181017 and referenced throughout the EIS.

The BLM places great import on the best available information, including new scientific studies and government reports that indicate a potential change in our assumptions or conditions related to a land use planning effort. The BLM has to balance reviewing new information with determining what information is relevant to a decision in light of the BLM's purpose and need. Many commenters highlighted information and studies to the BLM to consider, and the BLM has reviewed each source submitted. Further, the BLM asked the USGS to participate in the review, and to verify if information was included in the USGS synthesis report that was developed for the Draft EIS. Many suggested articles were already included for analysis in the USGS report, and may have been missed by commenters in the initial review of the synthesis report and Draft EIS.

Both known and new studies were reviewed by BLM staff, including scientists and NEPA specialists, and each BLM State Office reviewed each study specific to how it informed their planning decisions and environmental conditions. The BLM has included, where appropriate, updates to analysis in the appropriate EISs. Overall, submitted studies did not offer information that changed the analysis of the plans/EISs and did not offer any new conditions or other information the BLM had not considered already. The BLM has reviewed all new information and suggested studies from comments received rangewide, and in specific states. Further, the BLM takes new information seriously, and identified 11 articles from the studies suggested in comments. These 11 studies are sorted below by whether they were review by the BLM by being cited in the USGS Report, being references in the bibliography of the USGS Report, or by the BLM considering them during the RMP Amendment development and review of comments. Articles not specifically addressed below were still reviewed during comment response development.

Cited in USGS Synthesis Report

Baumgardt, J. A., Reese, K. P., Connelly, J. W., & Garton, E. O. (2017). Visibility bias for sage-grouse lek counts. Wildlife Society Bulletin, 41(3), 461-470.

Smith, K. T., Beck, J. L., & Pratt, A. C. (2016). Does Wyoming's Core Area Policy protect winter habitats for greater sage-grouse?. Environmental Management, 58(4), 585-596.

Dinkins, J. B., Smith, K. T., Beck, J. L., Kirol, C. P., Pratt, A. C., & Conover, M. R. (2016). Microhabitat conditions in Wyoming's Sage-grouse Core Areas: effects on nest site selection and success. PloS one, 11(3), e0150798.

Green, A. W., Aldridge, C. L., & O'donnell, M. S. (2017). Investigating impacts of oil and gas development on greater sage-grouse. The Journal of Wildlife Management, 81(1), 46-57.

Edmunds, D. R., Aldridge, C. L., O'Donnell, M. S., & Monroe, A. P. (2018). Greater sage-grouse population trends across Wyoming. The Journal of Wildlife Management, 82(2), 397-412.

Gamo, R.S. & Beck, J.L. Environmental Management (2017) 59: 189. https://doi.org/10.1007/s00267-016-0789-9.

Not cited, but considered and in USGS Synthesis Report Bibliography

Spence, E. S., Beck, J. L., & Gregory, A. J. (2017). Probability of lek collapse is lower inside sage-grouse Core Areas: Effectiveness of conservation policy for a landscape species. PloS one, 12(11), e0185885.

Juliusson, L. M., & Doherty, K. E. (2017). Oil and gas development exposure and conservation scenarios for Greater sage-grouse: Combining spatially explicit modeling with GIS visualization provides critical information for management decisions. Applied geography, 80, 98-111.

Not included in USGS Report, but considered by BLM in review (this includes the new WAFWA and USFS studies that were not published before the Draft EISs)

WAFWA Gap Analysis 2018

Cross, T. B., Schwartz, M. K., Naugle, D. E., Fedy, B. C., Row, J. R., & Oyler-McCance, S. J. (2018). The genetic network of greater sage-grouse: Range-wide identification of keystone hubs of connectivity. Ecology and Evolution, 8(11), 5394-5412.s

Kitzberger, T., Falk, D. A., Westerling, A. L., & Swetnam, T. W. (2017). Direct and indirect climate controls predict heterogeneous early-mid 21st century wildfire burned area across western and boreal North America. PloS one, 12(12), e0188486

C.1.6 Disturbance and Density Caps

Summary: NSO in priority habitat should be maintained

Response: BLM is focused on aligning our management with the states. BLM's goal is to promote consistency and alignment with each State's management for Greater Sage-Grouse, including the approach to implementing actions to reduce threats to sage-grouse. The analysis and decisions in the

RMPs are based on the information provided by the State agencies and are based on the latest available science and information regarding GRSG.

Summary: Existing disturbance caps should be maintained

Response: BLM is focused on aligning our management with the states. BLM's goal is to promote consistency and alignment with each State's management for Greater Sage-Grouse, including the approach to implementing actions to reduce threats to sage-grouse. The analysis and decisions in the RMPs are based on the information provided by the State agencies and are based on the latest available science and information regarding GRSG.

Summary: Disturbance caps are inadequate because they permit severe localized impacts

Response: The BLM analyzed the impacts of the disturbance cap in 2015 and in 2018, where appropriate, and disclosed the potential for localized impacts. Mitigation is designed to reduce some of these impacts to a level below the thresholds established in the plans.

Summary: Disturbance caps don't account for fragmentation

Response: The BLM recognizes the risk that habitat fragmentation poses to greater sage-grouse and its habitats. The BLM analyzed the impacts, including fragmentation, of the disturbance cap in 2015 and in 2018, where appropriate, and disclosed the potential for fragmentation. Disturbance caps are one tool in a broader management strategy that BLM employs to minimize habitat fragmentation. The density cap is designed to reduce some of these impacts to below the thresholds established in the plans. Further, the BLM also addresses fragmentation through mechanisms other than disturbance caps. For example, the conservation measures that apply in PHMA address threats to GRSG, including fragmentation. Those measures include, but are not limited to, disturbance and density caps.

C.1.7 Fire and Invasive Species

Summary: The approach to managing noxious and invasive weeds needs to be more specific. The analysis should also include the 2018 Western Association of Fish and Wildlife Agencies (WAFWA) Gap Report.

Response: BLM has comprehensive strategies to address invasive species and has been implementing those strategies. Improving invasive species management did not emerge as an issue during scoping to increase management alignment or flexibility.

C.1.8 General Habitat Management Areas

Summary: The public submitted studies for consideration by the BLM in support of maintaining protections for General Habitat Management Areas (GHMA). The importance of GHMA to genetic conservation was not given sufficient attention in the analysis

Response: Removing GHMA is being evaluated as a potential way to better align federal management with that of the state. The BLM reviewed the best available science and finds that while there is evidence that gene-flow and connectivity is facilitated by GHMA, presents a sufficiently low risk to species persistence that additional analysis of this impact related to GHMA removal, beyond that in the draft EIS, is not warranted.

C.1.9 Guidance and Policy

Summary: Discretionary waivers and modifications create uncertainty in the application of protections that was not adequately analyzed.

Response: Under the Proposed Plan, waivers, exemptions and modifications would be granted only when meeting specific criteria designed to advance the management goals and objectives in the RMPs. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering whether to grant a waiver, exception, or modification. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

Summary: BLM should tailor policies closer to state policy rather than providing general discretion.

Response: BLM implementation actions must conform with plan goals and objectives. The details of implementation are guided by current policy which are discretionary and open to change based on amendments to RMPs.

Summary: Secretarial Orders referenced in the Draft EISs need additional clarifying language for how they are guiding the direction of the Draft EISs.

Response: BLM is ensuring this planning effort conforms with the guidance and direction contained in Secretary's Orders, including SO 3353, Greater Sage-Grouse Conservation and Cooperation with Western States. The Proposed Plan explains the relationship between various SOs and this planning process in greater detail. The BLM will continue to manage public lands in conformance with its approved land use plans, while future policies and Secretary's Orders may provide guidance and direction about how BLM implements those plans.

C.1.10 Habitat Boundary/Habitat Management Area Designations

Summary: BLM should use a strict 3% area threshold on administrative boundary changes. Changes to habitat boundaries exceeding 3% in area should require a new plan amendment.

Response: The thresholds for amending plans are defined in BLM's planning handbook and often depend on specific context. The BLM is committed to streamlined and effective processes using plan maintenance and other measures when appropriate. Habitat boundaries are adjusted according to specific criteria and whether modified via plan maintenance or amendment will be determined at the appropriate time. Public participation will be commensurate with the level of planning and BLM policy.

Summary: Discretionary waivers and modifications introduce uncertainty to protections that were not adequately analyzed.

Response: Under the Proposed Plan, waivers, exemptions and modifications would be granted only when meeting specific criteria designed to advance the management goals and objectives in the RMPs. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering whether to grant a waiver, exception, or modification. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

Summary: Secretarial Orders referenced in the Draft EISs need additional clarifying language for how they are guiding the direction of the Draft EISs

Response: The BLM is ensuring this planning effort conforms with the guidance and direction contained in Secretary's Orders, including SO 3353, Greater Sage-Grouse Conservation and Cooperation with Western States. The Proposed Plan explains the relationship between various SOs and this planning process in greater detail. The BLM will continue to manage public lands in conformance with its approved land use plans, while future policies and Secretary's Orders may provide guidance and direction about how BLM implements those plans

C.1.11 Habitat Management Areas

Summary: The spatial extent of habitat management areas should not be modified.

Response: HMAs reflect habitat which is mapped based on best available information. If BLM and the state finds that habitat was not reflected correctly in light of new information, plan maintenance or an amendment can be used to update boundaries to reflect the change in information.

Summary: The management prescriptions associated with habitat management areas should not be modified.

Response: The purpose of these plan amendments is to increase consistency with state management. In some cases that may result in changes to management within the HMAs..

Summary: Restoration targets for Priority Habitat Management Areas (PHMA) should be developed and incorporated into the plans.

Response: While BLM has not developed specific restoration targets, the BLM has committed to significant restoration and recovery actions. The BLM spent considerable time and energy on the development of the FIATs that identify specific areas for specific types of actions and used that as a basis for requesting funding from Congress. Some targets have been developed, but are not included in the plans for reasons such as uncertainty of funding to implement the actions to reach the targets.

C.1.12 Habitat Objectives

Summary: BLM should more closely align its specific habitat objectives with the 2018 USGS report.

Response: BLM's habitat objectives reflect the best available information defining habitat conditions that sage-grouse preferentially select. The USGS report confirms BLM's assumption that such understanding may change over time. BLM has developed the flexibility in the plans to modify seasonal habitat objectives based on new science or site-specific information.

C.1.13 Lands and Realty

Summary: BLM should not dispose of lands with sage-grouse because transferring lands out of federal ownership introduces regulatory uncertainty and risks reducing habitat connectivity.

Response: BLM disposes of lands based on programmatic guidance and policy, and following specific criteria. Land and realty actions are often implementation level decisions that must conform with the sage-grouse goals and objectives identified in these RMP amendments.

C.1.14 Lek Buffers

Summary: Lek buffers should be maintained to protect leks.

Response: The BLM agrees that lek buffers are one of many important conservation tools available to manage sagebrush habitat and protect Greater Sage-Grouse. The BLM is retaining, and in some instances modifying/clarifying the application of lek buffers as a management tool.

Summary: Lek buffers should be larger than prescribed in the plan amendments.

Response: As applicable, each RMPA has an appendix that addresses lek buffers and allows the BLM to adjust lek buffers based on the best available science, this would allow the BLM to adjust the buffers based on new information as well. Further, some states are clarifying the approach in this RMPA effort, or adjusting to better align with their individual State's management. For more specific information, please refer to the individual plans and their associated lek buffer appendix.

Summary: The public submitted studies for consideration by the BLM in support of larger lek buffers.

Response: The BLM reviewed all submitted studies, and additional information. Please see the response to Data and Science comments for a response to this study.

C.1.15 Mitigation

Summary: Mitigation provisions in the 2015 plans were relied on in the USFWS 2015 finding. Mitigation should follow consistent principles. Mitigation could benefit from different strategies in different states. Mitigation provides stronger, faster decisions on project authorizations

Response: BLM's Proposed Plan balances the risk of uncertainty against the benefits of management flexibility when considering mitigation strategies. The BLM is committed to applying and enforcing the mitigation hierarchy of actions to avoid, minimize, and otherwise mitigate impacts to the extent that federal law allows. A principal component of GRSG management is the implementation of mitigation actions to ameliorate the threats and impacts to sage grouse and its habitats. The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy.

Summary: Mandatory net-gain and compensatory mitigation is supported by some commenters, and objected to by others.

Response: BLM's Proposed Plan balances the risk of uncertainty against the benefits of management flexibility when considering mitigation strategies. Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of the public lands (Instruction Memorandum No. 2018-093, *Compensatory Mitigation*, July 24, 2018). However, the BLM is committed to applying and enforcing the mitigation hierarchy of actions to avoid, minimize, and otherwise mitigate impacts to the extent that federal law allows. A principal component of GRSG management is the implementation of mitigation actions to ameliorate the threats and impacts to sage grouse and its habitats. The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-

Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy.

Summary: Various commenters argued that the "net conservation gain" standard should be retained, modified or eliminated. Many commenters requested clarification of the BLM's authority to impose compensatory mitigation.

Response: Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation to offset environmental effects beyond the proponents level of impact. The Proposed Plan seeks to clarify that the mitigation standard applies not at the project level, but rather as a planning-level goal and objective unless specifically required under a state management authority. The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan.

Summary: Various commenters argued that recent changes in mitigation policy and the applicability to sage-grouse warrant additional analysis, public review, or a SEIS.

Response: Public input on implementing mitigation, "including alternative approaches to requiring compensatory mitigation in BLM land use plans," was explicitly requested as part of the public comment period on the 2018 Draft EIS (see page ES-8, Section ES.4.2, last sentence of second paragraph). The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy. Because this clarification simply aligns the Proposed Plan Amendment with BLM policy and with the scope of compensatory mitigation authority expressly provided by FLPMA, and because any analysis of compensatory mitigation relating to future projects would necessarily be fact-specific and evaluated in project-specific NEPA documents, there is limited value in attempting to do so at the level of land use planning.

Summary: Many commenters stated the BLM should clarify how it will implement compensatory mitigation.

Response: The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan. The BLM will defer to a state methodology for habitat quantification if such a tool exists and incorporate the state's assessment into the appropriate NEPA documentation. The Proposed Plan Amendment clarifies that BLM will consider compensatory mitigation only as a component of compliance with a state mitigation plan, program, or authority, or when offered voluntarily by a project proponent. The Proposed Plan further clarifies the application of the mitigation standard as a planning-level goal and objective for sage-grouse habitat conservation. BLM commits to cooperating with the State to analyze applicant-proffered or state-imposed compensatory mitigation to offset residual impacts. BLM may then authorize such actions consistent with NEPA analysis and the governing Resource Management Plan.

C.1.16 Modifying Waivers, Exceptions, and Modifications of Fluid Minerals

Summary: One-time exceptions should be preferred over more expansive exceptions

Response: Under the Proposed Plan, waivers, exceptions, and modifications would be granted only when meeting specific criteria designed to advance the management goals and objectives in the RMPs. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering whether to grant a waiver, exception, or modification. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

Summary: Waivers should be narrowly defined.

Response: Under the Proposed Plan, waivers, exceptions, and modifications would be granted only when meeting specific criteria designed to advance the management goals and objectives in the RMPs. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering whether to grant a waiver, exception, or modification. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

Summary: There should be opportunity for public notice and comment for certain types of waivers, exceptions, or modifications.

Response: The BLM will comply with 43 CFR 3101.1-4 regarding public notification of waivers, exceptions, or modifications, which includes a 30-day public notification period. An exception is a limited type of waiver and therefore is subject to 43 CFR 3101.1-4.

C.1.17 Noise Management Outside of PHMA

Summary: Noise restrictions should be stronger. The public submitted studies for consideration by the BLM in support of stronger restrictions on noise. The public suggested changes to the noise measurement methods.

Response: BLM has determined the noise restrictions are adequate to balance best available information with the goals and objectives of the Proposed Plan and to meet the Purpose and Need.

C.1.18 Preferred Alternative

Summary: The preferred alternative should be the No Action Alt because it was relied on for the 2015 listing decisions.

Response: The proposed plan was chosen based on the BLM's stated purpose and need, coordination with cooperating agencies, and public comment. The no action was not the sole factor USFWS relied upon when reaching it's 2015 listing determination. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering the selection of a proposed plan. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

C.1.19 Prioritization of Mineral Leasing

Summary: No summary—implementation-level decision

C.1.20 Range of Alternatives

Summary: The range of alternatives is unreasonably narrow.

Response: The range is adequate to address the agency's purpose and need for considering these amendments. And by incorporating the 2015 plans by reference, BLM avails itself of a larger range of management options previously analyzed in a broadly distributed EIS. Further, BLM considered a number of alternatives and issues during scoping that the agency determined not to carry forward.

Summary: The no-action alternative does not reflect a proper baseline.

Response: The No-Action Alternative represents the current management plan as it is implemented on the ground across 11 states and over 90 RMPs, including US Forest Service lands, thereby reflecting a management baseline that is well understood by BLM.

C.1.21 Recreation

Summary: Recreation and its socioeconomic benefits are tied to sagebrush ecosystems

Response: The BLM agrees and ensures that recreation-related projects and actions in sage-grouse habitats conform with management goals and objectives from the 2015 management plans.

C.1.22 Required Design Features (RDFs)

Summary: NSO stipulations should be maintained in priority habitats.

Response: BLM is focused on aligning our management with the states. BLM's goal is to promote consistency and alignment with each State's management for greater sage-grouse. In most cases, the proposed plan maintains NSO restrictions and other management prescriptions. Where BLM has increased its management flexibility, it has done so to improve alignment with the state plans and based on local information. The impact to sage-grouse from disturbance and habitat fragmentation is well documented in the 2015 EIS.

C.1.23 Sagebrush Focal Areas (SFAs)

Summary: Sagebrush focal areas (SFAs) should not be removed. Inconsistency in retention and removal of SFA across states is arbitrary and capricious. BLM is not legally required to remove SFA. Justifications for eliminating SFAs are inadequate.

Response: BLM is focused on aligning our management with the states. BLM's goal is to promote consistency and alignment with each State's management for greater sage-grouse. Where BLM has increased its management flexibility, it has done so to improve alignment with the state plans and based on local information. BLM has determined that SFA designations provide a redundant layer of resource protection and land use prioritization within PHMA and is acting within its discretion to remove SFA designation. Further, the BLM canceled the proposed withdrawal of SFAs through a publication in the Federal Register on October 11, 2017 (82 Fed. Reg. 47,248) and findings in the Sagebrush Focal Area Draft EIS noted that there was broadly low potential for locatable minerals within the recommended withdrawal area, so the withdrawal would not have provided additional protection to GRSG.

C.1.24 Sage-Grouse

Summary: Regulatory changes and regulatory uncertainty increase the likelihood of listing of the species under the ESA. The impacts analysis is deficient. Protections afforded by the plans aren't sufficient to prevent listing of the species.

Response: BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility and alignment when considering changes to the 2015 plans. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

C.1.25 Statutes and Regulations

Summary: The BLM must respect valid existing rights, including those reflected in oil and gas leases issued under the Mineral Leasing Act. The BLM also implements land use planning decisions differently with respect to uses related to the Mining Law of 1872.

Response: All proposed actions contained in the RMPA will be subject to valid existing rights, including those associated with leases issued under the Mineral Leasing Act of 1920. Accordingly, the BLM will ensure that its implementation of the management actions in the RMPA is consistent with the terms and conditions in existing leases or existing contracts. For example, if the BLM previously issued an oil and gas lease with standard lease terms and conditions, and the lessee submits an application for permit to dill, the BLM will ensure that any management actions from the RMPA will be applied in a manner that is consistent with the terms and conditions of the underlying oil and gas lease.

The BLM also recognizes that it has limited authority to impose conditions on certain uses related to the Mining Law of 1872 through land use planning decisions. Accordingly, the BLM will apply management actions in the RMPA only to the extent that they are consistent with the Mining Law of 1872 and the BLM's regulations.

Summary: The purpose and need is unreasonably narrow.

Response: The agency's purpose and need for considering these amendments was carefully drawn to promote alignment with the State's plans and policies while satisfying the BLM's responsibilities under FLPMA, other applicable laws, and BLM policy. This planning effort also builds off the comprehensive 2015 planning and NEPA process; incorporates the 2015 Final EIS analysis by reference in its entirety, including its alternatives; and has been informed by a scoping process that has identified specific opportunities to improve alignment with state plans.

Summary: The purpose and need is driven solely by applicant objectives.

Response: The planning and NEPA process does not respond to any applications submitted to the BLM. The BLM's intention is to build upon the 2015 plans by improving access and management flexibility by better aligning our management plans with the States' management plans. The purpose and need reflects this intent consistent with the agency's mission and Administration's priorities.

Summary: The BLM inappropriately tiered to a document of equal scope. The BLM failed to summarize and relate applicability of material incorporated by reference to the new plans.

Response: BLM is using incorporation by reference to streamline our analysis consistent with Administrative priorities. Incorporation of the 2015 EIS by reference is allowable under BLM regulations and is appropriate in this circumstance because the purpose of this action builds upon the goals and objectives of the 2015 EIS. Further, the CEQ 40 Questions, Question 24c, states that, "Tiering is a procedure which allows an agency to avoid duplication of paperwork through the incorporation by reference of the general discussions and relevant specific discussions from an environmental impact statement of broader scope into one of lesser scope or vice versa." The BLM has summarized and referenced applicable aspects of the 2015 EIS throughout the 2018 EIS, but especially in Chapters 2 and 4.

Summary: The BLM failed to consider and designate Areas of Critical Environmental Concern (ACECs).

Response: BLM properly considered and analyzed the designation of ACECs in 2015. No new information suggests it is necessary to reconsider those decisions and BLM has determined the issue of ACECs to fall outside the scope of this effort to better align federal management with state management plans.

Summary: BLM fails to incorporate an appropriate Analysis of Management Situation.

Response: . BLM analyzed the management situation in full compliance with its regulations and policies. The BLM evaluated inventory and other data and information, partnering with USGS and coordinating extensively with States, to help provide a basis for formulating reasonable alternatives. The BLM described this process in its Report to the Secretary in response to SO 3353 (Aug. 4, 2017). Among other things, the Report describes how the BLM coordinated "with each State to gather information related to the [Secretary's] Order, including State-specific issues and potential options for actions with respect to the 2015 GRSG Plans and IMs to identify opportunities to promote consistency with State plans." (Report to the Secretary at 3.) This process overlapped to some degree with the BLM's scoping process, which also assisted the BLM in identifying the scope of issues to be addressed and significant issues, and with coordination with the States occurring after the Report. In addition, as described in Draft EIS Chapter 3, the BLM determined that the current management situation is similar in condition to that assessed in 2015.

C.1.26 Travel and Transportation Management

Summary: Travel plans should be part of the plan amendments.

Response: Travel management planning is a crucial aspect in implementing land use plans. Ongoing travel management decisions in sage-grouse habitat are guided by the 2015 plans, with clarifications in the 2018 plan. Those BLM offices with travel plans in GRSG habitat would also conform with the goals and objectives, and planning decisions in these amendments.

C.1.27 Waivers, Exceptions, and Modifications

Summary: The uncertainty with how waivers, exceptions, and modifications will be used introduces uncertainty to protections that aren't fully analyzed. Criteria for the use of waivers, exceptions, and modifications should be more narrowly prescribed.

Response: Under the Proposed Plan, waivers, exemptions and modifications would be granted only when meeting specific criteria designed to advance the management goals and objectives in the RMPs. BLM's proposed plan balances the risk of uncertainty against the benefits of management flexibility when considering whether to grant a waiver, exception, or modification. Planning criteria identified for this amendment include consideration of how planning decisions may impact future listing determinations under the ESA.

Summary: BLM should monitor the use of waivers, exceptions, and modifications.

Response: BLM currently monitors and tracks disturbance in Greater Sage-Grouse habitats. Some BLM states, through the fluid minerals program, track waivers, exceptions, and modifications. The BLM is currently reviewing how to apply these best management practices at the national level.

C.2 NEVADA-CALIFORNIA-SPECIFIC COMMENT RESPONSES

C.2.1 Issue: Purpose and Need

Summary: The purpose and need violates NEPA by attempting to align with state plans and neglecting federal consistency, resulting in a narrow scope and restricting the possible range of alternatives.

Response: The agency's purpose and need was carefully drawn to improve alignment with the State of Nevada's Sage Grouse Conservation Plan and California Department of Fish and Wildlife's conservation strategies, while complying with the BLM's responsibilities under FLPMA and other applicable laws and BLM policy.

Summary: The purpose and need differs from the 2015 EIS and should consider a new range of alternatives.

Response: The purpose and need for this RMPA/EIS does differ from the 2015 EIS' purpose and need. In this 2018 Final EIS, the BLM has analyzed the Management Alignment Alternative and the Proposed Plan Amendment to respond to the 2018 purpose and need.

Summary: A commenter expressed concern regarding credible science for the purpose and need and the lack of focus on the major threats to Greater Sage-Grouse such as habitat loss and fragmentation, wildfires, and invasive weeds.

Response: The major threats posed to the Greater Sage-Grouse population in Nevada and Northeastern California (wildfire and invasives) were addressed in the 2015 ARMPA, would not be affected by this plan amendment, and therefore were not further analyzed in this 2018 planning process.

Summary: BLM should revert to the original land use plan purpose, avoidance of an ESA listing. Any changes to the management plan should be done via minor plan amendments or plan maintenance.

Response: The original land use plan's purpose would not allow BLM to respond to SO 3353 or new best available science. As specified in the Draft EIS Chapter 3: Affected Environment, in certain instances (i.e. Adaptive Management for GRSG populations and updates to habitat modeling), there is now best available science that warrants the agency to re-evaluate certain decisions within the existing ARMPA via amendment not maintenance actions.

C.2.2 Issues Dismissed from Detailed Analysis

Summary: The majority of commenters expressed concern about dismissing the issue of predators from detailed analysis. Raven protection under the Migratory Bird Treaty Act hinders predator control and GSGR conservation measures.

Response: The BLM will comply with all applicable laws, including the Migratory Bird Treaty Act. As such, and as stated in the Draft EIS, removing predators is outside the scope of this amendment. The BLM has authority to manage the habitat and has provided management actions (within the existing ARMPA that are not being amended in this effort) to address predation risk.

Summary: Where BLM lacks the authority to implement mitigation measures for hunting and predation, BLM should employ the help of other agencies and disclose the agencies and mitigation measures in the EIS and ROD.

Response: A footnote in the Executive Summary and Chapter 1 has been added to stress that BLM will work with agencies with predator removal and hunting authorities.

Summary: BLM should not dismiss the issues of Wildland Fire and Fire Management and Wild Horse and Burros and focus on management that extends beyond controlling numbers of WHB.

Response: The existing ARMPA already contains robust wildland fire and wild horse and burro management actions that would not be modified by the plan amendments, which is why these issues were not carried forward for additional analysis.

Summary: A company requested that the three percent density disturbance cap be more flexible for proposed projects in areas of anthropogenic disturbance already above the cap.

Response: The three percent disturbance cap was not proposed for modification, as this cap was not an alignment concern elevated by the States,, and therefore does not address the purpose and need of better aligning with the State plans.

Summary: Few of the references in the Noise section include hypotheses or field studies relating noise impacts on GSGR; the references utilized are based on assumptions rather than data and are not easily obtainable.

Response: The best available science regarding noise impacts on GRSG were included in Appendix M of the 2015 ARMPA and are incorporated by reference for this DRMPA/EIS. In addition, several management actions pertaining to noise impacts were included in the 2015 ARMPA based on the best available science.

C.2.3 Habitat Boundary/Habitat Management Area Designations

Summary: Coates et al. 2014 is not "best available science," BLM needs to use the most recent edition of this reference (2016) and field-verified data to update the Habitat Management Area boundaries. In addition, BLM should not restrict ground-truthing analysis to Stiver et al.

Response: The Management Alignment Alternative includes the adoption of the modeled habitat management categories based on 2016 Coates et al., and as modified by the State of Nevada, which was the basis for HMA mapping changes between the No Action and Management Alignment Alternative.

Summary: BLM states that maps will be updated every 3-5 years. Updates to maps should incorporate the most recent on-the-ground data and local government input. Invalid and outdated data impedes Sage-Grouse conservation.

Response: BLM has included local agencies (as appropriate) to the list of partners that will engage in the mapping refinement process.

Summary: Site-specific land use decisions should require habitat assessments by a qualified biologist and not depend on project-specific maps.

Response: The BLM has adopted methods in Stiver regarding site specific assessments in order to have a consistent method of assessing GRSG habitats through the use of best available science.

Summary: Plan amendments may be required to habitat boundary maps as new data becomes available; one commenter recommended involving the public before making any changes to maps.

Response: BLM has added the term "or amendment, as appropriate" to the Modifying Habitat Management Area Designations Issue within Chapter 2 for the Proposed Plan Amendment.

Summary: Commenters were concerned about SGMA boundary adjustments in relation to other habitat classifications, biologically significant units, and Lek Clusters as well as reliance on Coates et al. rather than State of Nevada's SGMA boundaries.

Response: A footnote regarding the relationship between the State of Nevada's Sage Grouse Management Areas (SGMA) and HMAs have been incorporated in Chapter 2. In addition, Figures 2-2a and 2-2b (figures depicting BSUs and lek clusters) have been updated to depict what HMAs lie within these areas.

Summary: One commenter requested a map of the overall Habitat Management Area.

Response: Maps depicting the entirety of HMAs across all land jurisdictions within the planning area can be found in Figures 1-1a and 1-1b.

Summary: BLM needs to acknowledge that the maps are derived from a modeling exercise, habitat classifications mapped as priority, general or other, may include areas of non-habitat by Sage-Grouse and SFA lands must not be automatically reclassified as PHMA as in the 2015 plan.

Response: The issue statement for Modifying Habitat Management Area Designations has been updated to include the following statement: "Need for adjusting habitat management areas so that they reflect the best available science based on continually evolving updates to habitat and use modeling (Coates et al. 2016) and are consistent with habitat management areas identified by the State of Nevada and recommended by CDFW." Within the Management Alignment Alternative and Proposed Plan Amendment, areas previously identified as SFA would not be automatically mapped as PHMA, but would be mapped as PHMA, GHMA, and OHMA based on the habitat modeling conducted by USGS in 2016.

Summary: Commenters expressed concern about erroneous PHMA boundaries conflicting with county uses such as transportation and administrative access, as well as mineral exploration, property rights, livestock grazing, and recreation uses.

Response: Several commenters highlighted specific on-the-ground inconsistencies between local field surveys and how HMA mapping was derived (based on the modeling exercises conducted by USGS to delineate habitat management area categories, as modified by the State of Nevada). Commenters also commented on how erroneous mapping may impact certain uses that are important to counties. The Management Alignment Alternative and Proposed Plan Amendment have accounted for these inconsistencies and concerns by incorporating proposed exceptions to land use plan allocation decisions tied to PHMA, GHMA, and OHMA (see Chapter 2 – Allocation Exception Process).

Summary: A commenter requested that BLM consider area north of the Thacker Pass project for priority habitat classification, claiming site surveys show no Sage-Grouse in the Thacker Pass Project area.

Response: Several commenters highlighted specific on-the-ground inconsistencies between local field surveys and how HMA mapping was derived (based on the modeling exercises conducted by USGS to delineate habitat management area categories, as modified by the State of Nevada). Commenters also commented on how erroneous mapping may impact certain uses that are important to counties. The Management Alignment Alternative and Proposed Plan Amendment have accounted for these inconsistencies and concerns by incorporating proposed exceptions to land use plan allocation decisions tied to PHMA, GHMA, and OHMA (see Chapter 2 – Allocation Exception Process).

Summary: Commenters requested that BLM re-designate OHMA and GHMA acres conflicting with transportation corridors within the Clark Project site through plan maintenance.

Response: Several commenters highlighted specific on-the-ground inconsistencies between local field surveys and how HMA mapping was derived (based on the modeling exercises conducted by USGS to delineate habitat management area categories, as modified by the State of Nevada). Commenters also commented on how erroneous mapping may impact certain uses that are important to counties. The Management Alignment Alternative and Proposed Plan Amendment have accounted for these inconsistencies and concerns by incorporating proposed exceptions to land use plan allocation decisions tied to PHMA, GHMA, and OHMA (see Chapter 2 – Allocation Exception Process).

Summary: Commenters requested further explanation in the preferred alternative as to the habitat management area designations not constituting a land use plan decision.

Response: Several commenters highlighted specific on-the-ground inconsistencies between local field surveys and how HMA mapping was derived (based on the modeling exercises conducted by USGS to delineate habitat management area categories, as modified by the State of Nevada). Commenters also commented on how erroneous mapping may impact certain uses that are important to counties. The Management Alignment Alternative and Proposed Plan Amendment have accounted for these inconsistencies and concerns by incorporating proposed exceptions to land use plan allocation decisions tied to PHMA, GHMA, and OHMA (see Chapter 2 – Allocation Exception Process).

Summary: BLM should grant allocation exceptions when the agency is provided with field-verified data that conflicts with Figure 2-1b and allocation exceptions should include OHMAs in addition to PHMA and GHMA classifications.

Response: Several commenters highlighted specific on-the-ground inconsistencies between local field surveys and how HMA mapping was derived (based on the modeling exercises conducted by USGS to delineate habitat management area categories, as modified by the State of Nevada). Commenters also commented on how erroneous mapping may impact certain uses that are important to counties. The Management Alignment Alternative and Proposed Plan Amendment have accounted for these inconsistencies and concerns by incorporating proposed exceptions to land use plan allocation decisions tied to PHMA, GHMA, and OHMA (see Chapter 2 – Allocation Exception Process).

Summary: BLM must clarify connectivity of PHMA and GHMA populations.

Response: Connectivity was a criteria that USGS considered during its modeling efforts of HMAs.

Summary: Describing the loss of one million acres of PHMA as a minor action in impacts of the Management Alignment Alternative section is subjective.

Response: Given the magnitude of overall acres designated as PHMA, GHMA, and OHMA in the planning area, the decreases (and increases) in acres between the two alternatives is considered minor.

C.2.4 Sagebrush Focal Area Designations

Summary: Include new language regarding the District's Court Order about SFAs.

Response: Language regarding the District's Court Order about SFAs has been added to the summary statements contained in the executive summary, Chapter 1, and Chapter 2.

Summary: The Draft EIS needs to clarify that the SFA would be managed according to actual habitat characteristics based on site-specific, on-the-ground habitat data and not be automatically designated as a PHMA.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, areas identified as SFA in the No Action Alternative will be managed based on their underlying HMA designations as identified in the USGS 2016 map (as modified by the State of Nevada). They will not be automatically designated as PHMA.

Summary: The BLM should reconsider withdrawal of SFAs as these areas included 2.7 percent of leks, which is significant for a species on the decline.

Response: On October 11, 2017, the proposed withdrawal for SFAs was cancelled (82 *Federal Register* 47248) as explained in [Section 1.1 and 2.3.2 of the EIS]. The recommendation to withdraw SFAs would now inconsistent with the rationale for canceling the proposed withdrawal. The No Action Alternative did analyze the recommendation to withdraw these areas as captured in Chapter 4 of the Draft EIS, which incorporated by reference analysis from the 2015 Final EIS and 2016 SFA Withdrawal Draft EIS.

Summary: Withdrawing the SFAs and allowing mining uses will increase the risk of invasive plant colonization.

Response: Direct, indirect, and cumulative effects (such as those related to the increased risk from invasive plants) associated with the action to withdraw or not to withdraw SFAs was included in the proposed SFA Withdrawal Draft EIS, which was incorporated by reference in the Draft EIS.

Summary: BLM must remove all reference to SFAs. SFAs are an overreach and unnecessary as priority habitat designations provide adequate habitat protection.

Response: The Management Alignment Alternative, as well as the Proposed Plan Amendment would remove the SFA designation (see page 2-8 of the Draft EIS) and manage those lands based on their underlying HMA designations.

Summary: SFAs are inconsistent with County management plans and violate the multiple use mandate of FLPMA by conflicting with County land uses.

Response: On March 31, 2017, the United States District Court for the District of Nevada held that the BLM violated the National Environmental Policy Act (NEPA) by failing to prepare a supplemental EIS for the designation of SFA in the Nevada and Northeastern California Greater Sage-Grouse Resource Management Plan Amendment in Nevada. This RMPA/EIS responds to the Court's order by evaluating the SFA designation in the No-Action Alternative and providing the public with an opportunity to review and comment on that evaluation.

Summary: SFA removal should be considered in the No Action Alternative in addition to the Preferred Alternative.

Response: On March 31, 2017, the United States District Court for the District of Nevada held that the BLM violated the National Environmental Policy Act (NEPA) by failing to prepare a supplemental EIS for the designation of SFAs in the Nevada and Northeastern California Greater Sage-Grouse Resource Management Plan Amendment in Nevada. This RMPA/EIS responds to the Court's order by evaluating the SFA designation in the No-Action Alternative and providing the public with an opportunity to review and comment on that evaluation.

C.2.5 Habitat Objectives

Summary: Objectives and goals need to be more explicit.

Response: The purpose of the DRMPA/EIS is to adhere to SO orders 3353 & 3355 while ensuring protections for the GRSG. The majority of the goals and objectives outlined in the 2015 ARMPA would not be modified through the Management Alignment Alternative or Proposed Plan Amendment, as these alternatives specifically address the seven planning issues within the Draft RMPA/EIS.

Summary: Habitat objectives restricting livestock grazing need to be more flexible. One commenter requested removal or modification of MG LD 5, 6, 8, and 10 from Objective SSS 1 in relation to permitted livestock grazing.

Response: The habitat objectives do not restrict livestock grazing. Land Health Standards remain the primary tool for managing livestock grazing. All habitat objectives are based on ecological site potential and descriptions. Through plan clarification (as specified in the Draft EIS, Chapter 1), Management Decision LG 5 (and references to this management decision in Management Decisions LG 6 and 10 would be removed), as Management Decision LG 5 is not consistent with existing BLM grazing regulations (43 CFR 4160.1).

Summary: Indicators for grass height should be re-evaluated to ensure the heights analyzed in the referenced studies are accurately correlated with nest success.

Response: BLM used the best available local science and worked in coordination with State agencies, USFWS, FS and USGS to develop the most appropriate indicators and metrics. All citations are referenced in Table 2-2 of the ARMPA. Within the Management Alignment Alternative and Proposed Plan Amendment, the habitat objectives table (Table 2-2) would be revised to incorporate best available science in coordination with representatives from the SETT, USFWS, NDOW, CDFW, USFS, USGS, University of Nevada, Reno (UNR), University of California, appropriate local agencies, and BLM. The team would review and incorporate the best available science and would recommend adjustments based on regionally and locally derived data.

Summary: Add a bullet to read "Clarify that Habitat Objectives are actually desired outcomes expressed as goals (not truly objectives) consistent with BLM Planning Handbook (H- 1601-1) p. 12."

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, the Habitat Objectives table in the 2015 Final EIS would be implemented following this guidance: "The Habitat Objectives table in the 2015 Final EIS are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Objectives should be based on sources such as ecological site descriptions, associated state-and-transition models."

C.2.6 Issue: Adaptive Management

Summary: BLM's adaptive management procedures are not effective at preventing or minimizing wildfire risks; procedures should focus on pre-fire measures to reduce risks, such as reducing fuel loads.

Response: Within the Proposed Plan Amendment, BLM has incorporated changes to the Adaptive Management Strategy (Appendix D) presented in the Draft EIS to align with the State of Nevada's Adaptive Management Strategy that was adopted by the State's Sagebrush Ecosystem Council on July 17 and August 30, 2018. The revised strategy now includes "fire risk" as one of the habitat warnings that will be assessed twice a year through this adaptive management strategy.

Summary: Provisions in the adaptive management protocols in Appendix D cannot be applied to mineral projects because they are not consistent with claimants' rights per FLPMA and the U.S. Mining Law.

Response: BLM will address valid existing rights under FLPMA and the 1872 Mining Law during site specific NEPA and project analysis.

Summary: The Draft EIS lacks a list of specific actions BLM would take when hard triggers are reached. The EIS should contain metrics by which conservation success can be measured.

Response: The No Action Alternative's adaptive management strategy included a list of hard trigger responses in the form of new land use plan allocation decisions, found in Table J-1 and J-2 of the ARMPA. The Management Alignment Alternative and Proposed Plan Amendment would replace these immediate hard trigger responses with a collaborative process (which would include federal, state, and local agencies) to identify population triggers and habitat warnings, identify causal factors, recommend appropriate management responses, and monitor those responses to see if they are effective in responding to the causal factors associated with the population or habitat decline.

Summary: There are inconsistencies between Appendix J from the 2015 Final EIS and Appendix D in the 2018 Draft EIS, which appears to be a re-write of Appendix J.

Response: Changes to the Adaptive Management Strategy (Appendix D) as presented in the ARMPA would be made to align with the State of Nevada's Adaptive Management Strategy that was adopted by the State's Sagebrush Ecosystem Council on July 17 and August 30, 2018. This alignment corresponds with the planning effort's overall purpose and need, which is "to enhance cooperation with the states by modifying the approach to Greater Sage-Grouse management in existing RMPs to better align with individual state plans and conservation measures and with DOI and BLM policy."

Summary: The No Action Alternative is inexplicit regarding removing "triggered" allocation decisions and the preferred alternative does not contain a strong threshold to gauge success of GRSG in the area.

Response: Appendix D (Adaptive Management Strategy) as presented in the Management Alignment Alternative in the Draft EIS and as presented in the Proposed Plan Amendment includes a section titled "*Longevity of Trigger Responses (Removing the Trigger Response)*," which outlines a collaborative process (which would include federal, state, and local agencies) to evaluate when it is appropriate to remove a trigger response. Within the Management Alignment Alternative and Proposed Plan Amendment, the use of immediate "land use plan allocation" responses to a hard trigger would be removed.

Summary: BLM should involve appropriate Federal, State and local agencies, stakeholders and local universities in the Adaptive Management planning process, including monitoring and causal factor analysis.

Response: As specified in the updated Management Alignment Alternative and Proposed Plan Amendment's Adaptive Management Strategy (Appendix D), an "Adaptive Management Response Team (AMRT)" would be established to assist with identifying causal factors, recommending appropriate management responses, implementing those responses, and monitoring them for effectiveness. The AMRT would include federal, state and local agencies and partners (including but not limited to local area conservation groups, grazing permittees, and other affected authorized land users).

Summary: An organization requests that the Adaptive Management strategy of the State be fully implemented, whereas a commenter believes use of the State's strategy lacks detailed analysis and public input.

Response: Within the Proposed Plan Amendment, BLM has incorporated changes to the Adaptive Management Strategy (Appendix D) presented in the Draft EIS to align with the State of Nevada's Adaptive Management Strategy that was adopted by the State's Sagebrush Ecosystem Council on July 17

and August 30, 2018. Any implementation action taken on behalf of this strategy would require some level of site-specific NEPA, which will include a public participation component.

Summary: A County suggests removal of hard and soft triggers unless a more robust, scientific justification can be provided for their use.

Response: The recommendation to remove all soft and hard triggers would be outside the scope of this planning effort.

Summary: In Appendix D, page 4, what are the implications if triggers are not identified within the stated time frame?

Response: Appendix D includes a set of timelines as to when BLM (in collaboration with federal, state, and local agencies and partners) would conclude various steps outlined in the adaptive management strategy. Not abiding by these deadlines may result in continued population and/or habitat declines if baseline conditions continue without implementing appropriate management responses to respond to those conditions.

Summary: The following questions should be added to Appendix D: What is the appropriate causal factor analysis area and response area? Is recovery of the habitat and/or population(s) achievable? What are the appropriate (implementable at an appropriate scale and on an appropriate timeframe) responses (management actions) and the anticipated results of such responses? What is the monitoring protocol, responsibilities and reporting requirement associated with each response? What are the anticipated adaptive management changes to the initial responses if they don't achieve desired outcomes?

Response: As specified in Appendix D of the Proposed Plan Amendment, the appropriate scales used to analyze population triggers and apply management responses are at the individual lek, lek cluster, and biologically significant units (BSU). Adaptive management responses would only apply to habitat management areas (HMAs), which includes Priority, General and Other HMAs within these scales. Habitat adaptive management warnings and triggers would be analyzed only at the lek cluster scale. The assessment of GRSG population and habitat conditions, determination of causal factors, identification of appropriate management responses, implementation of those responses, and monitoring the effectiveness of those responses are captured in steps 1-5 of Appendix D.

Summary: The best adaptive management BLM can use is to abandon amendments and fully implement the 2015 plans.

Response: Abandoning this planning effort and not incorporating modification to the existing adaptive management strategy (Appendix D) would not be consistent with the effort's purpose and need, which is "to enhance cooperation with the states by modifying the approach to Greater Sage-Grouse management in existing RMPs to better align with individual state plans and conservation measures and with DOI and BLM policy."

Summary: There must be a focus on individual allotments through Allotment Management Plans (AMPs) to complete ecological inventories.

Response: If developing an allotment management plan is a recommended management response to respond to a causal factor, individual allotment ecological inventories would be considered during this process.

C.2.7 Mitigation

Summary: Compensatory mitigation on public lands is not consistent with FLPMA and specifically prohibits impairment of a claimant's rights under the Mining Law of 1872. The "net conservation gain" standard should be removed in the Final EIS.

Response: BLM's Proposed Plan balances the risk of uncertainty against the benefits of management flexibility when considering mitigation strategies. Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of the public lands (Instruction Memorandum No. 2018-093, *Compensatory Mitigation*, July 24, 2018). However, the BLM is committed to applying and enforcing the mitigation hierarchy of actions to avoid, minimize, and otherwise mitigate impacts to the extent that federal law allows. A principal component of GRSG management is the implementation of mitigation actions to ameliorate the threats and impacts to sage grouse and its habitats. The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy

Summary: How will net conservation gain be accomplished if projects with valid existing rights move forward with mitigation efforts that are not commensurate with direct, indirect, cumulative, and permanent impacts?

Response: Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation to offset environmental effects beyond the proponents level of impact. The Proposed Plan seeks to clarify that the net gain standard applies not at the project level, but rather as a planning-level goal and objective unless specifically required under a state management authority. The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan.

Summary: A company requested that the Sage-Grouse Bank Enabling Agreement (March 2015) be referenced and utilized to calculate impacts and compensatory mitigation.

Response: The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan. The BLM will defer to a state methodology for habitat quantification if such a tool exists and incorporate the state's assessment into the appropriate NEPA documentation. The Proposed Plan Amendment clarifies that BLM will consider compensatory mitigation only as a component of compliance with a state mitigation plan, program, or authority, or when offered voluntarily by a project proponent. The Proposed Plan further clarifies the application of the mitigation standard as a planning-level goal and objective for sage-grouse habitat conservation. BLM

commits to cooperating with the State to analyze applicant-proffered or state-imposed compensatory mitigation to offset residual impacts. BLM may then authorize such actions consistent with NEPA analysis and the governing Resource Management Plan.

Summary: The BLM needs to better define "net conservation gain" and how it will base measures on a consistent basis. If BLM doesn't have the authority to require mitigation for certain land uses, then it must disclose that.

Response: The BLM remains committed to achieving the planning-level management goals and objectives identified in this RMPA, including achieving a net gain in conservation (consistent with the State of Nevada's sage-grouse management plan) at the landscape-level by ensuring sage-grouse habitat impacts are addressed through implementing mitigating actions (avoid, minimize, reduce, replace or compensate) in combination with other management actions across all lands. The BLM also recognizes that Greater Sage-Grouse is a state-managed species. Accordingly, the agency is coordinated with the State of Nevada to develop a memorandum of agreement (MOA) to guide the application of the mitigation hierarchy and compensatory mitigation actions for future project authorizations in Greater Sage-Grouse habitat on public lands. The MOA will likely incorporate the State's policies, authorities and programs for Greater Sage-Grouse conservation and describes how BLM will include the avoidance, minimization, and other recommendations from the State, being necessary to improve the condition of Greater Sage-Grouse habitat consistent with RMPA goals and objectives, in one or more of the NEPA analysis alternatives.

Summary: Change "net conservation gain" to "equivalent number of functional habitat acres" or "no net loss of habitat."

Response: Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation to offset environmental effects beyond the proponents level of impact. The Proposed Plan seeks to clarify that the net gain standard applies not at the project level, but rather as a planning-level goal and objective unless specifically required under a state management authority. The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan.

Summary: The BLM should use Nevada's Conservation Credit System (CCS) as a methodology for developing mitigation options and if it does not then clarify how this RMPA aligns with the State Plan. BLM should require mitigation in all three habitat types (PHMA, GHMA, and OHMA) as expressed in the State plan.

Response: The BLM is pursuing agreements with the States of Colorado, Idaho, Nevada, Oregon, Utah and Wyoming to clarify how BLM, project proponents, and state management agencies will collaborate to implement a State's compensatory mitigation plan. The BLM will defer to a state methodology for habitat quantification if such a tool exists and incorporate the state's assessment into the appropriate NEPA documentation. The Proposed Plan Amendment clarifies that BLM will consider compensatory mitigation only as a component of compliance with a state mitigation plan, program, or authority, or when offered voluntarily by a project proponent. The Proposed Plan further clarifies the application of the mitigation standard as a planning-level goal and objective for sage-grouse habitat conservation. BLM

commits to cooperating with the State to analyze applicant-proffered or state-imposed compensatory mitigation to offset residual impacts. BLM may then authorize such actions consistent with NEPA analysis and the governing Resource Management Plan.

Summary: The BLM should clarify what mitigation standards it can implement and when it can require mitigation. Language should be added to acknowledge BLM's authority to require mitigation in case-specific circumstances and explanation of "criteria exemptions."

Response: BLM's Proposed Plan balances the risk of uncertainty against the benefits of management flexibility when considering mitigation strategies. Following extensive review of FLPMA, including existing regulations, orders, policies, and guidance, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of the public lands (Instruction Memorandum No. 2018-093, *Compensatory Mitigation*, July 24, 2018). However, the BLM is committed to applying and enforcing the mitigation hierarchy of actions to avoid, minimize, and otherwise mitigate impacts to the extent that federal law allows. A principal component of GRSG management is the implementation of mitigation actions to ameliorate the threats and impacts to sage grouse and its habitats. The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy.

Summary: BLM should make explicit in Appendix F mitigation activities occurring at federal and state levels respectively, mitigation projects occurring outside the CCS, and utilization of HQT to quantify impacts of anthropogenic disturbances.

Response: Appendix F has been removed in the Proposed Plan Amendment, as it is no longer applicable under current policy and regulation. However, BLM has made it explicit in Chapter 2 for the Proposed Plan Amendment that "when authorizing third-party actions that would result in direct, indirect, or cumulative impacts on Greater Sage-Grouse or their habitat, the BLM would require those impacts to be quantified using the most current version of the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes to Greater Sage-Grouse habitat quality and quantity."

Summary: BLM must, through a supplemental EIS or other means of information, evaluate the impacts of IM 2018-093, which prohibits BLM from utilizing compensatory mitigation.

Response: Public input on implementing mitigation, "including alternative approaches to requiring compensatory mitigation in BLM land use plans," was explicitly requested as part of the public comment period on the 2018 Draft EIS (see page ES-8, Section ES.4.2, last sentence of second paragraph). The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy. Because this clarification simply aligns the Proposed Plan Amendment with BLM policy and with the scope of compensatory mitigation authority expressly provided by FLPMA, and because any analysis of compensatory mitigation relating to future projects would necessarily be fact-specific and evaluated in project-specific NEPA documents, there is limited value in attempting to do so at the level of land use planning.

Summary: Commenters expressed concern regarding the costs associated with mitigation.

Response: BLM's Proposed Plan balances the risk of uncertainty against the benefits of management flexibility when considering mitigation strategies. The BLM is committed to applying and enforcing the mitigation hierarchy of actions to avoid, minimize, and otherwise mitigate impacts to the extent that federal law allows. A principal component of GRSG management is the implementation of mitigation actions to ameliorate the threats and impacts to sage grouse and its habitats. The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy.

Summary: A commenter requested a public comment period to discuss how BLM should consider and implement mitigation in respect to GRSG and alternative approaches to compensatory mitigation.

Response: Public input on implementing mitigation, "including alternative approaches to requiring compensatory mitigation in BLM land use plans," was explicitly requested as part of the public comment period on the 2018 Draft EIS (see page ES-8, Section ES.4.2, last sentence of second paragraph). The Proposed Plan clarifies how voluntary compensatory mitigation should be considered in the management of Greater Sage-Grouse habitat and how BLM will work with each state management agency to implement its compensatory mitigation strategy. Because this clarification simply aligns the Proposed Plan Amendment with BLM policy and with the scope of compensatory mitigation authority expressly provided by FLPMA, and because any analysis of compensatory mitigation relating to future projects would necessarily be fact-specific and evaluated in project-specific NEPA documents, there is limited value in attempting to do so at the level of land use planning.

C.2.8 Exceptions/ Variances from Non-Fluid Mineral Sage-Grouse Restrictions

Summary: In the Draft EIS Table 2-2, page 2-12, BLM should revise language regarding exceptions and better define criteria to avoid loopholes and generalizations. Evaluate proposed exceptions transparently with public input. Definitions should include habitat fragmentation, mining exemption criteria, ecological potential criteria, HQT, de minimus impacts, and valid existing rights.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, all authorizations subject to use of an allocation exception would still be required to conduct a site specific NEPA analysis, which would include a public participation component. It is also important to note that allocation exception would be required to be approved by the BLM's Nevada and/or California State Director.

Summary: The No-Action Alternative fails to provide exceptions for county emergency response, issues related to public health and safety, and county administrative functions.

Response: While not contained within the No Action Alternative, the Management Alignment Alternative and Proposed Plan Amendment would include allocation exceptions associated with authorizations that address public health and safety and routine administrative function conducted by State or local governments.

Summary: Commenters suggested that one-time exceptions be used for oil and gas leases and that FWS submit information for consideration before granting waivers, exceptions, and modifications.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, one-time exceptions would be replaced with simplified allocation exceptions applicable to all allocations, not just those associated with No Surface Occupancy. In addition, the BLM is not required to conduct Section 7 consultation for species that are not listed or a candidate under the Endangered Species Act. However, the BLM does and will continue to coordinate with the USFWS on projects and conservation activities conducted in the planning area.

Summary: One organization requested that there be a conservation net gain wherever there is geothermal, salable minerals, oil and gas, or wind energy development under the No-Action Alternative and Preferred Management Alignment

Response: On July 24, 2018, the Bureau of land Management issued Instruction Memorandum (IM) 2018-093, Compensatory Mitigation. As outlined in the IM, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of public lands. As such, the BLM has also determined that requiring compensatory mitigation to achieve a "net conservation gain" is inconsistent with the agency's authority under FLPMA. Therefore, the BLM has revised the proposed plan amendment to align with existing policy and regulation by removing the net conservation gain standard and any requirements for mandatory compensatory mitigation.

C.2.9 Seasonal Timing Restrictions

Summary: The No Action and Management Alignment Alternative do not include exceptions in seasonal timing restrictions for emergency actions and response, road maintenance, human health and safety, or activities within a buffer of leks.

Response: The Management Alignment Alternative and Proposed Plan Amendment include a waiver to modify (in coordination with NDOW and/or CDFW) the seasonal timing restriction dates if "modifications are needed to address an immediate public health and safety concern in a timely manner (e.g., maintaining a road impacted by flooding)." In response to comments, an additional exception would also be added to the Proposed Plan Amendment to modify seasonal timing restriction dates if a "proposed action would be determined a routine administrative function conducted by State or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e. rights-of-way for roads) that serve such a public purpose."

Summary: The Management Alignment Alternative lacks an explanation of where seasonal restrictions should be and only differs from No Action Alternative to allow modification of seasonal restriction dates if the project serves to enhance GSGR habitats.

Response: In response to comments, seasonal habitats have been defined in the Final EIS' Glossary. Due to the fact that seasonal habitats fluctuate over time and include site-specific coordination with NDOW and CDFW to determine their adequacy at the time an authorization is being proposed and analyzed, seasonal habitat areas were not mapped in this RMPA. In addition, seasonal timing restriction dates (within the Proposed Plan Amendment) would include waivers associated with public health and safety concerns and routine administrative functions conducted by State and local governments.

Summary: Seasonal timing restrictions are overly restrictive for grazing; dates should be specific to each grazing allotment and flexible depending on annual weather conditions.

Response: Seasonal restrictions would be evaluated through the site specific livestock grazing permit renewal process.

Summary: Travel necessary for mineral purposes cannot be restricted by seasonal times per mining rights under the U.S. Mining Law.

Response: Any restrictions (including seasonal timing restrictions) are subject to valid existing rights and all federal laws and mandates, including the 1872 Mining Law.

C.2.10 Lek Buffers

Summary: Lek buffers are not fully analyzed nor provided for public review. A SEIS should be completed unless BLM believes the issue was properly analyzed, in which case previous analysis needs to be cited.

Response: The analysis contained in the 2015 Final EIS (Section 4.4 through Section 4.21), which was incorporated by reference in the 2018 Draft EIS, included analysis that was appropriate at a land use planning level, considering the impacts to Greater Sage-Grouse and various programs and resources from the implementation of entire alternatives, not solely on individual management prescriptions contained within them. The lek buffer appendix (Appendix B) through clarification (plan maintenance) has been slightly modified to clarify that lek buffer distances are not to be "applied" as a land use plan allocation, but rather used as a tool to assess and address impacts at the project specific NEPA level.

Summary: The current plan identifies a restriction of development within 3.0 miles from the perimeter of occupied leks but a standard calls for the complete restriction on land use for infrastructure throughout the PHMA.

Response: As outlined in Appendix B, the lower interpreted range of lek buffer distances vary for roads, fences, infrastructure, etc. These distances were derived from *USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014- 1239)*. The commenter's reference to a "standard" that imposes a complete restriction on land use for infrastructure throughout the PHMA is not consistent with any proposed management action in the No Action or Management Alignment Alternative.

Summary: Addition of the 1.2-mile buffer zone for fences was not supported by USGS' Open File Report; this buffer only apples for flat or rolling terrain.

Response: BLM has made the clarification in Appendix B that low structures (e.g., fences, rangeland structures) within 1.2 miles of leks are subject to modification only within areas of flat and rolling terrain.

Summary: Language in the Lek Buffers section should be revised to state that BLM will utilize general lek buffer distances and guidance identified in the USGS Open File Report 20141239 to establish the evaluation area around leks used to identify impacts.

Response: BLM has made the clarification in Appendix B that the BLM, "through project specific NEPA analysis, will assess and address impacts from the following activities using the lower end of the

interpreted range of lek buffer-distances and guidance identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014-1239)."

Summary: A commenter believes that the lek buffers are rigid, distance-based, one-size-fits-all measures and the restrictions have the potential to put millions of acres of land off-limits to multiple use.

Response: One set lek buffer distance for all types of authorizations is not appropriate and the BLM (through Appendix B) recognizes this, which is why the interpreted ranges for lek buffer distances between various types of actions differ (e.g. 1.2 miles for low structures and 3.1 miles for linear features). In addition, Appendix B also allows for justifiable departures from these distances to address this flexibility concern.

Summary: BLM should eliminate the lek buffer zone restrictions in Appendix B. Once the lek breeding season is over for the year, the lek buffer restrictions should not apply.

Response: Considering impacts to leks only during the breeding season does not coincide with best available science, such as the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014-1239).

Summary: Site characteristics, including landscape features such as topography, must be considered in the lek buffer zone determination.

Response: BLM has included the term "topography" in the following clarifying statement within Appendix B: "Justifiable departures to decrease or increase from these distances from the lek where impacts are anticipated, based on local information and data, best available science, landscape features (i.e., topography), and other existing protections (e.g., land use allocations, state regulations), or factors reducing visibility and audibility may be appropriate.

Summary: Any restrictions that are warranted to protect occupied leks during the breeding season must respect claimants' rights under the U.S. Mining Law and related land use policies.

Response: All proposed actions contained in RMPA will be subject to valid existing rights, including those associated with the 1872 Mining Law.

Summary: Lek buffers must be developed in conjunction with local knowledge of GRSG seasonal movements and population responses to management actions. For the Nevada LUPA, apply changes to lek buffers as new information and science becomes available.

Response: If justifiable departures to lek buffer distances are warranted at the site specific scale, local information and data (as specified in Appendix B) would be considered.

Summary: A commenter requested that BLM extend the lek buffers beyond 2 miles to reduce the effects of indirect impacts.

Response: Lek buffer distances can be increased or decreased (as specified in Appendix B) and would be analyzed on a site specific project basis.

Summary: A County requested that BLM allow regular administrative and emergency services within lek buffer areas when required.

Response: Allowing regular administrative and emergency services within lek buffer areas would be considered on site specific project basis.

C.2.11 Required Design Features

Summary: It should not be the responsibility of the applicant to identify appropriate RDFs. Rather it should be the BLM field office personnel who examine a project and select appropriate RDFs

Response: The responsibility of identifying appropriate RDFs will be conducted internally by a BLM interdisciplinary team working on the NEPA analysis associated with a specific project. However, BLM may wish to work with third party applicants in completing this worksheet for the project.

Summary: A commenter suggested specific revisions to items and language in Appendix C.

Response: Various modifications to Appendix C: Required Design Features were made based on commenters feedback. These changes are highlighted in gray text in Appendix C.

Summary: The Draft EIS states that no allocation decisions are tied to OHMA but the Required Design Features worksheets show that they are applicable to OHMA. Please clarify.

Response: BLM has corrected Chapters 2 and 4, clarifying that some land use plan allocation decisions (such as those associated with land tenure) do apply to OHMA. RDFs would also be applied to OHMA.

Summary: Many of the RDFs are not applicable to non-discretionary activities pursuant to the U.S. Mining Law and should be modified to not prevent mineral development.

Response: All proposed actions (including application of RDFs) contained in the RMPA will be subject to valid existing rights, including those associated with the 1872 Mining Law.

Summary: A commenter believes the RDF perch deterrents will increase operation and maintenance costs and time spent in the field which would lead to increased disturbance on GRSG from maintenance crews.

Response: One of three reasons to justify the departure from implementing a specific RDF for a particular project (provided in Appendix C) is if "a specific RDF will provide no additional protection to GRSG or its habitat." In the event the NEPA analysis for a site specific project suggests that through the application of the RDF, more disturbances are projected, then this can be documented within the project file through the use of the RDF worksheet and specified in the project's NEPA document.

Summary: A commenter requested removal of RDF GEN 10 from the RMPA because there is no evidence provided in the document to support a provision to minimize the impacts of livestock windmills or pump jacks on Sage-Grouse habitat.

Response: In the event that RDF GEN 10 is determined not to be effective in providing additional protections to GRSG, this can be documented on the RDF worksheet (Appendix C) and the RDF would not be required.

Summary: Fences are not considered tall structures and there is no evidence that fences create additional perches for avian predators. BLM should update fence standards based on the NRCS fence standards and specifications.

Response: In the event that an alternative RDF is determined to provide equal or better protection for GRSG or its habitat (through the use of other design features, such as fence standards outlined by NRCS), then this can be documented on the RDF worksheet (Appendix C) and the RDF would not be required.

Summary: A commenter requested the EIS disclose the metrics used in RDF determination for types of actions to be proposed in PHMA and GHMA designated lands.

Response: For the Management Alignment Alternative and Proposed Plan Amendment, Appendix C would be the appropriate matrix used to document application or departures from the application of RDFs in PHMA, GHMA, and/or OHMA.

Summary: BLM should keep "no surface occupancy" stipulations in place to protect habitat from drilling activities and geothermal development.

Response: Within the Management Alignment Alternative (Proposed Plan Amendment), the BLM has retained the no surface occupancy (NSO) stipulation (open with major stipulations) for PHMA. This stipulation did not change from the No Action Alternative (2015 ARMPA), however, the criteria for waiving, excepting, or modifying this stipulation has been simplified in the Proposed Plan Amendment, as described in Chapter 2.

C.2.12 Fire and Invasive Species

Summary: The Final EIS should quantify the acreage that burned in each type of HMA and explain how, if at all, the impacts of fire were factored into the modified HMA designated boundaries. The EIS should also clarify whether the burned lands in the PHMA or GHMA would retain their existing designations or would no longer be designated as PHMA or GHMA.

Response: BLM has incorporated the acres burned between 2015-2017, split up by specific habitat management areas (PHMA: 357,805; GHMA: 400,534;OHMA: 373,347) in Chapter 3 of the Final EIS. Areas of PHMA, GHMA, and OHMA that have burned would still maintain their designations until a future amendment or plan maintenance action is conducted, following the process specified in Chapter 2. Existing designations of HMAs are based on modeling efforts conducted by USGS (Coates et. al. 2016) and as modified and approved by the State of Nevada. The modeling of habitat management areas conducted by USGS is derived from: (1) adding radio and GPS telemetry locations; (2) integrating output from high resolution maps (1–2 m2) of sagebrush and pinyon-juniper cover; (3) modifying the spatial extent of the analyses to match newly available vegetation layers; (4) explicit modeling of relative habitat suitability during three seasons (spring, summer, winter); (5) accounting for differences in habitat availability between more mesic sagebrush steppe; (6) integrating the three seasonal maps into a composite map of annual relative habitat suitability; (7) deriving updated land management categories

based on previously determined cut-points for intersections of habitat suitability and an updated index of sage-grouse abundance and space-use (AUI); and (8) masking urban footprints and major roadways out of the final map. For more detailed info please see Coates et al. 2016: products. https://pubs.er.usgs.gov/publication/ofr20161080. It is possible that the removal of sagebrush from 2015 to 2016 were reflected in the updated vegetation layers which could have reduced the suitability of those areas that burned from 2015-2016.

Summary: Wildfire management should be addressed in the RMPA/EIS, not just in a PEIS. BLM should provide funding for management that includes reduction of fuel loads, pre-suppression techniques, and post fire rehabilitation.

Response: The 2015 ARMPA included management actions associated with addressing the threats to wildfire and invasives, which are not being modified through this land use planning effort. However, fire risk has been included as an adaptive management warning for sage grouse habitat within Appendix D, consistent with the adaptive management strategy contained in the State of Nevada's Sage Grouse Conservation Plan (2014 as amended). Funding associated with implementation level activities is outside the scope of this planning effort.

Summary: Many commenters requested use of managed livestock grazing as a means of reducing fuel loads and affirmed that restricting grazing will increase vegetative fuel loads and increase wildfires.

Response: Restricting livestock grazing (specific to identifying areas as unavailable to livestock grazing) is not analyzed or incorporated in the RMPA. In addition, use of managed livestock grazing as a means of reducing fuel loads (targeted grazing) is a tool that BLM can implement and would not be prevented based on the provisions in any of the alternatives analyzed in this planning effort.

Summary: BLM needs to address the threat of invasive plant species as well as sagebrush and other shrub encroachment in fire management considerations.

Response: Management prescriptions associated with reducing invasives was analyzed and discussed in the 2015 Final EIS and have been incorporated by reference in the DRMPA.

Summary: Priorities for re-establishment of sagebrush cover should be re-evaluated with "recently burned native areas" receiving first consideration.

Response: Considering priorities for re-establishment of sagebrush cover is outside the scope of this planning effort.

C.2.13 Outcome Based Grazing

Summary: Fuel load levels across the sub-region are a prominent threat to sage grouse and local economies. Moving forward, the BLM needs to recognize the use of livestock grazing as a tool to reduce this threat.

Response: BLM Nevada and California will continue to pursue outcome-based grazing initiatives that will exhibit a new management paradigm that BLM managers and livestock operators can use to establish management practices that can achieve specific management objectives that respond to changing, on-

the-ground conditions such as increased fuel loads when appropriate. This will better ensure healthy rangelands, high-quality wildlife habitat, and economically sustainable ranching operations.

C.2.14 Land Health Assessments

Summary: The LUPAs fail to recognize that many range improvements are associated with water rights owned or held by the permittee. LUPA needs to identify that existing rights will not be impaired or taken.

Response: All existing management action contained in the No Action Alternative and proposed management actions contained in the Management Alignment Alternative and Proposed Plan Amendment would not conflict with existing water rights in the State of Nevada and California.

Summary: Range improvements and supplemental feeding are critically important for achieving standards of rangeland health and for herd health. The LUPAs apply a negative focus on range improvements, including but not limited to water developments and fencing.

Response: While range improvements would need to comply with required design features and seasonal habitat restrictions, management flexibility has been incorporated into the Management Alignment Alternative and Proposed Plan Amendment to ensure that these restrictions are appropriate to conserve Greater Sage-Grouse, while still allowing activities such as range improvements to be implemented in a timely manner.

C.2.15 New Alternative

Summary: A commenter suggested a new maximum GRSG protection alternative, that BLM pledge to restore GRSG habitat lost to wildfires or other events on an annual basis. Another commenter requests that the land management plans adopted in 2015 be totally replaced with the Nevada Greater Sage-Grouse Conservation Plan. All state plans should be managed federally, regardless of state boundaries.

Response: BLM is focused on aligning its management with the states. BLM's stated purpose and need is to achieve consistency with each State's management for Greater Sage-Grouse. As discussed in detail in Chapter 1, issues were dismissed from detailed analysis because they did not align with the State's management plan, are not consistent with Federal laws or policies, or if the alternatives were already considered and analyzed in detail during the planning process for sage grouse that concluded in 2015. In the 2015 Final EIS, a maximum GRSG protection alternative and the Nevada Greater Sage-Grouse Conservation Plan (State's Alternative) were analyzed. Requiring all existing state plans to be managed federally is outside the scope of this planning effort.

C.2.16 Preferred Alternative

Summary: Documents developed to implement the Obama Administration's land use plans and mitigation are no longer consistent with current policy and cannot be used for the Preferred Alternative. Specifically, landscape-scale land use restrictions based on the NTT Report such as uniform lek buffers, seasonal restrictions, noise restrictions, disturbance caps, and required design features need to be eliminated and replaced with project-specific conditions.

Response: The Proposed Plan Amendment has been modified to respond to the latest policies enacted by the Secretary of the Interior, including IM 2018-093: Compensatory Mitigation. The alternatives

presented in the Draft EIS and now the Final EIS also respond to the planning issues that were identified during scoping to respond to the purpose and need, which is to align with the States in regards to Greater Sage-Grouse conservation.

Summary: The preferred alternative should include state and local perspectives in land use planning and decision making.

Response: BLM appreciates the engagement from all stakeholders throughout this land use planning process and has worked closely with local governments, as well as other Federal agencies and the State of Nevada and CDFW to formulate the Management Alignment Alternative and Proposed Plan Amendment. BLM has worked with stakeholders to ensure that the preferred alternative is not only responsive to the overall purpose and need for this planning effort, but also incorporates proposed management direction that reflects local perspectives.

Summary: BLM cannot include elements from the alternatives in the 2015 plan into the Preferred Alternative.

Response: The alternatives presented in the Draft EIS and now the Final EIS respond to the planning issues that were identified during scoping to respond to the purpose and need, which is to align with the States in regards to Greater Sage-Grouse conservation. Some components from the alternatives analyzed in the 2015 Final EIS were carried forward in the Management Alignment Alternative, including the 2015 No Action Alternative and the State's Alternative.

Summary: The use of "net conservation gain" in this alternative needs to be updated to be consistent with the State Plan definition.

Response: On July 24, 2018, the BLM issued Instruction Memorandum (IM) 2018-093, Compensatory Mitigation. As outlined in the IM, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of public lands. As such, the BLM has also determined that requiring compensatory mitigation to achieve a "net conservation gain" is inconsistent with the agency's authority under FLPMA. Because the majority of comments associated with mitigation focus on the net conservation gain standard and requirements for compensatory mitigation, the BLM has concluded that these issues have been adequately addressed through the revisions that align the proposed plan with existing policy and regulation leaving the remainder outside the scope of the current plan and BLM's authority to require compensatory mitigation.

C.2.17 Range of Alternatives

Summary: The No Action Alternative is not consistent with FLPMA and Department of the Interior policies and does not satisfy the purpose and need of the proposed action. Because the No Action Alternative cannot be selected, the Draft EIS proposes only one alternative, violating NEPA.

Response: The BLM's intention is to build upon the 2015 plans by improving access and management flexibility by better aligning our management plans with the States' management plans. The purpose and need reflects this intent consistent with the agency's mission and Administration's priorities.

Summary: The SFA designations, the net conservation gain mitigation standard, uniform lek buffer zones, disturbance and density caps, rigid adaptive management triggers, and travel restrictions in the No Action Alternative/2015 LUPs are landscape-scale management provisions that are unauthorized per Congress' revocation of the Planning 2.0 Rule and violate FLPMA.

Response: The 2015 ARMPAs were finalized before the Planning 2.0 rule was initiated by the BLM in late 2016. In addition, SFA designations, lek buffers, and adaptive management are all issues that are being addressed within the alternatives analyzed in this land use planning process.

Summary: BLM should reconsider the three percent cap on anthropogenic disturbance in proposed project areas and making PHMA an avoidance area for transmission lines greater than or equal to 100kV. Both inhibit new development, which violates the U.S. Mining Law.

Response: Given the three percent disturbance cap exception for the State of Nevada (as described in the existing ARMPA), disturbance caps were not a component within the existing ARMPA that would need to be modified to address the overall effort's purpose and need. In addition, the allocation exception process proposed in the Management Alignment Alternative and Proposed Plan Amendment provide the needed flexibility to allow various projects to be implemented across the sub-region. Finally, all actions proposed in the Management Alignment Alternative and Proposed Plan Amendment would be subject to valid existing rights, including those pursuant to the 1872 Mining Law.

Summary: One organization believes the range of alternatives is insufficient and that BLM should add a conservation alternative to reduce habitat loss and population declines of GSGR.

Response: The range of alternatives (including the No Action Alternative and Management Alignment Alternative) is adequate to address the purpose and need for these amendments. By incorporating the 2015 plans by reference, BLM avails itself of a larger range of management options previously analyzed in a broadly distributed EIS. Further, BLM considered a number of alternatives and issues during scoping that the agency determined not to carry forward.

Summary: One mining company expressed concern regarding withdrawal implications for the Wood Gulch area under the No Action Alternative.

Response: Removal of the recommendation to withdraw SFA from the 1872 Mining Law (which includes the Wood Gulch area) was analyzed and incorporated in the Management Alignment Alternative and Proposed Plan Amendment.

Summary: Why does BLM claim that reducing total acreage OHMA's by 17% under the preferred alternative is negligible?

Response: When considering the magnitude of change in OHMA acres between the two alternatives in the context of the overall planning area, BLM still affirms that the reduction in OHMA (which in some instances shifted acres to GHMA, which includes added land use plan allocation protection) would be negligible.

C.2.18 Data and Science

Summary: The Draft EIS does not follow the OMB standard for peer review. Scientific research and documentation is limited in scope with repetitive authors, especially lacking in current rangeland research, bird counts, and lek data. Analysis should be modified based upon the best available information, including state and local expertise.

Response: BLM has followed the appropriate peer reviewed process identified by the commenter. The best available local science was included in the 2015 ARMPA and in the DRMPA. Please see the references used in the 2015 ARMPA and DRMPA. Lek data has been incorporated into both documents and many sections were developed in close coordination with local and federal partners.

Summary: The Final EIS should incorporate the October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment to supplement the Affected Environment and Environmental Consequences sections for Geology and Minerals.

Response: The October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment referenced by the commenter was incorporated into the analysis contained in this Draft EIS, as the December 2016 SFA Withdrawal Draft EIS was incorporated by reference in several locations of this Draft EIS and Final EIS (see Chapter 4). The October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment were key documents used as a resources in the December 2016 SFA Withdrawal Draft EIS.

Summary: To adequately reduce and restrict grazing, monitoring techniques need to utilize the Nevada Rangeland Monitoring Handbook and apply trend monitoring over multiple years.

Response: No proposed management actions within the Draft RMPA aim to restrict or reduce livestock grazing. In addition, BLM plans to utilize the Nevada Rangeland Monitoring Handbook as a preferred tool when monitoring rangeland resources for site specific activities.

Summary: BLM cannot definitively claim that Sage-Grouse were abundant prior to settlement by Americans, remove reference to this from the document. Include and base analysis on the fact that Sage-Grouse peaked in the 1960's per FWS Findings.

Response: References to sage grouse abundance prior to the 19th Century was not specifically referenced in this Draft EIS. However, this reference was cited in the 2015 Final EIS, referencing statements from the USFWS' Notice of 12–month petition from March 2010.

Summary: Eighty-four percent (84%) (20/24) of the successful nest sites reported by Hagen et al. 2007 were in "marginal" or "unsuitable" habitat as described by the HAF requirements. This indicates that the HAF information most likely discloses false findings / conclusions.

Response: The use of HAF assessments are outside the scope of this planning effort, as the appropriate use of the HAF should be conducted at the site specific scale.

Summary: The references cited for the riparian functionality requirement in the HAF are not valid.

Response: Requirements associated with conducting HAF assessments are outside the scope of this planning effort.

Summary: Coates et al. 2017 arbitrarily expands Sage-Grouse habitat 10 kilometers beyond the boundaries of Population Management Units and does not account for major freeways. This reference also includes five caveats that are not disclosed in the Draft RMPA.

Response: Coates et al. 2017 did not delineate Greater Sage-Grouse HMAs. Coates et al. 2014 and 2016 was used to delineate HMAs. A buffer of 8.5 kilometers was added to Population Management Units which was scientifically based. HMAs delineated in Coates et al. 2014 did include major freeways; however, Coates et al. 2016 which would be adopted in the proposed plan amendment (as modified by the State of Nevada) "masked urban footprints and major roadways out of the final map product" (Coates et al. 2017). In addition, the modifications made by the State of Nevada removes a majority of the 8.5 kilometer buffer by "clipping" all HMAs that fall outside the boundaries of the Biologically Significant Units. All other "caveats" or details regarding the map modeling process can be found in the USGS reports and are included by reference.

Summary: Appendix D is not consistent with the hard and soft warnings provided in Coates et al. 2017. Commenters questioned the size of area used to analyze triggers.

Response: See response above. Appendix D is consistent with the population triggers (signals) identified by USGS however, the terminology is different. As specified in Appendix D of the Proposed Plan Amendment, the appropriate scales used to analyze population triggers and apply management responses are at the individual lek, lek cluster, and biologically significant units (BSU). Adaptive management responses would only apply to habitat management areas (HMAs), which includes Priority, General and Other HMAs within these scales. Habitat adaptive management warnings and triggers would be analyzed only at the lek cluster scale.

Summary: Appendix D does not explain the rationale for cut-off response actions or explain actions for areas with less than 25% sagebrush cover.

Response: BLM appreciates the comment. The sagebrush cover percentages (habitat triggers) have been removed from Appendix D in an effort to align with the adaptive management strategy approved by the State of Nevada's Sagebrush Ecosystem Council on July 17 and August 30, 2018.

Summary: Appendix A depicts Biologically Significant Units, it is not clear how these were designated.

Response: A citation to Figure 2-2b (depicting BSUs for the Management Alignment Alternative and Proposed Plan Amendment) has been added, referencing Coates et al. 2017, *Hierarchical population monitoring of greater sage-grouse (Centrocercus urophasianus) in Nevada and California—Identifying populations for management at the appropriate spatial scale: U.S. Geological Survey Open-File Report 2017-1089.* BSUs under the Management Alignment Alternative and Proposed Plan Amendment are equivalent to "climate clusters" defined in Coates et al. 2017.

Summary: BLM does not include scientific evidence to support the claim that SFAs are the best habitat for Sage-Grouse and can only be protected by withdrawal.

Response: SFAs were delineated by the USFWS and adopted in the 2015 ARMPA. The MAA includes the removal of SFAs.

Summary: One commenter requested that BLM disclose that Sage-Grouse have not been observed or documented in the Stillwater Mountains for decades as documented in the 2001 Nevada Sage-grouse Conservation Plan.

Response: Habitat management areas are based, in part, on available habitat and habitat suitability. BLM and the State of Nevada have determined that PHMA, GHMA, and/or OHMA are not present in the Stillwater Mountains. See Figure 2-1b for the Management Alignment Alternative and Proposed Plan Amendment.

Summary: Table 1-1 shows acreages that total the state of Nevada, but the Planning Area in Figure 1-1 excludes all or portions of some counties. In addition, the table shows Department of Energy managing 2,600 acres but BLM shapefile of 3/10/2016 shows DoE lands totaling 879,758 for the state.

Response: BLM has included definitions related to ecological site descriptions, ecological site potential, and State and Transition Models within the Glossary of this Final EIS. BLM will rely on its current monitoring methods and use of these tools and can consider the use of disturbance response groups. However, monitoring methods are outside the scope of this EIS.

Summary: One commenter suggested researching science specific to the application of ESD, State and Transition Models, and Disturbance Response Groups for proper application and implementation.

Response: The BLM does not refute that wild horses have increased since 2015. Wild horse & burros were not carried forward for further analysis due to the determination that this EIS/Amendment would not alter the management direction for wild horse & burros as analyzed in the 2015 ARMPA.

Summary: BLM cannot state that wild horse "data and information in the 2015 Final EIS" has not substantially changed. Wild horse herds in NV grow at 15-20% per year and have since 2015. Real time data is readily available from the BLM itself.

Response: As outlined in Chapter 3 of the Draft EIS, the BLM requested the USGS to inform the effort through the development of an annotated bibliography of Greater Sage-Grouse science published since January 2015 (Carter et al. 2018) and a report that synthesized and outlined the potential management implications of this new science (Hanser et al. 2018). This report cited new science associated to impacts from discrete human activities, such as oil and gas development.

Summary: One commenter suggested BLM consider recent studies that confirm oil and gas development can harm both Sage-Grouse habitat and lifecycle activities.

Response: BLM continues and has used the best available science in developing alternatives that respond to the purpose and need for this planning effort.

Summary: Commenters questioned the correlations between vegetative cover and nest success due to variances in time of nest establishment and recording of vegetative heights. BLM should utilize best available science data and further analysis of references moving forward.

Response: BLM continues and has used the best available science in developing alternatives that respond to the purpose and need for this planning effort.

Summary: Commenters questioned why submitted volumes of peer reviewed scientific papers by some counties and other authored reports were omitted or ignored in the prior LUPA process and requests that BLM include the previously submitted data in the EIS.

Response: References submitted that were pertinent to the content outlined in the Final EIS have been added to the references. If suggested references did not correlate with the subject matter in the Final EIS or were not discussed, they were not included.

Summary: The LUPA failed to identify sagebrush species in accordance with standard Botanical taxonomy. The DRMP/EIS should refer to NRCS Ecological Site concepts and use technical basis provided by Cooperative Soil Survey, Ecological Site Description, and evaluation of plant communities in terms of Seral Status and State or Transition.

Response: While not referenced in the Draft EIS or Final EIS, the BLM wants to confirm that it does utilize NRCS Ecological Site information as well as Conservation Soil services, etc., specifically when conducting monitoring and range land health assessments.

Summary: BLM should be more explicit regarding criteria used to determine UUD. Who will determine UUD and when will this process occur?

Response: Undue and Unnecessary Degradation (UUD) is defined at 43 CFR 3809.5 and determined by an interdisciplinary team of agency specialists and is analyzed in site specific NEPA analysis. BLM utilizes 43 CFR 3809.4 to guide its assessment for determining when to take action necessary to prevent UUD under the Mining Law.

C.2.19 Assumptions and Methodology

Summary: The Conservation Credit System (CCS) is the best tool for case-specific mitigation of human impacts on Sage-Grouse habitat. It should be validated and enabled by BLM in this review process.

Response: On July 24, 2018, the BLM issued Instruction Memorandum (IM) 2018-093, Compensatory Mitigation. As outlined in the IM, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of public lands. As such, the BLM has also determined that requiring mitigation to achieve a "net conservation gain" is inconsistent with the agency's authority under FLPMA. Therefore, the BLM has revised the proposed plan amendment to align with existing policy and regulation by removing the net conservation gain standard and any requirements for mandatory compensatory mitigation. Because the majority of comments associated with mitigation focus on the net conservation gain standard and requirements for compensatory mitigation, the BLM has concluded that these issues have been adequately addressed through the revisions that align the proposed plan with existing policy and regulation leaving the remainder outside the scope of the current plan and BLM's authority to require compensatory mitigation.

Summary: Commenters asked how Nevada's Plan is related to BLM's land management plans and how the "net conservation gain" standard can be applied.

Response: On July 24, 2018, the BLM issued Instruction Memorandum (IM) 2018-093, Compensatory Mitigation. As outlined in the IM, the BLM has concluded that FLPMA does not explicitly mandate or authorize the BLM to require public land users to implement compensatory mitigation as a condition of obtaining authorization for the use of public lands. As such, the BLM has also determined that requiring mitigation to achieve a "net conservation gain" is inconsistent with the agency's authority under FLPMA. Therefore, the BLM has revised the proposed plan amendment to align with existing policy and regulation by removing the net conservation gain standard and any requirements for mandatory compensatory mitigation. Because the majority of comments associated with mitigation focus on the net conservation gain standard and requirements for compensatory mitigation, the BLM has concluded that these issues have been adequately addressed through the revisions that align the proposed plan with existing policy and regulation leaving the remainder outside the scope of the current plan and BLM's authority to require compensatory mitigation.

Summary: Retain the required use of the Habitat Quantification Tool (HQT) to avoid inconsistency and variability. It is currently unclear in the Draft EIS how often analysis will be conducted and what tool will be utilized to determine percent decline. If HQT is not utilized, the Final EIS should explain how mitigation would be quantified.

Response: Within the Proposed Plan Amendment, BLM has retained the management direction that when authorizing third-party actions that would result in direct, indirect, or cumulative impacts on Greater Sage-Grouse or their habitat, BLM would require impacts to be quantified using the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes to habitat quality and quantity.

Summary: One commenter requested additional details regarding the 3% disturbance cap for Biologically Significant Units and steps on how calculations were made so the results can be reproduced by different parties.

Response: The methods used to calculate anthropogenic disturbance levels at the BSU scale can be found within the Monitoring Framework contained in the 2015 ARMPA, at https://eplanning.blm.gov/epl-front-office/projects/lup/21152/63239/68488/NVCA_Appendix_D_GRSG_Monitoring_Framework_.pdf. Annual calculations at the BSU level are conducted by the BLM's National Operation Center annually and the results of which can be accessed on BLM's Landscape Approach Data Portal at https://landscape.blm.gov/geoportal/catalog/main/home.page. Much of the data used by the BLM to calculate disturbance at the BSU level is proprietary and may use different data standards for assessing certain types of disturbances, which may present challenges when third parties attempt to replicate this process. These datasets were identified by an interdisciplinary team due primarily to a regular update interval and consistent representation across the range of GRSG. Third parties wishing to replicate the process would be responsible for acquiring the necessary data licenses from the data providers identified in the Monitoring Framework.

Summary: BLM failed to provide support for the requirement of amending Conservation Plans; the 2015 plans have not been given adequate time for BLM to make any conclusions regarding their efficacy.

Response: Within the Executive Summary and Chapter 1 of the Draft EIS, BLM included a description of its purpose and need for this planning effort. BLM is also abiding by the timelines to complete this EIS, consistent with Secretarial Order 3355.

Summary: Monitoring schedules should be set and prioritized by the local office level on annual or periodic bases based upon staff-levels and budgets. Local offices should not over-obligate their staff with monitoring requirements, but instead provide a framework to ensure all areas are receiving adequate staff time to manage the resource.

Response: BLM will continue to train and work with local staff to ensure monitoring is conducted at the appropriate scheduled times, consistent with existing BLM monitoring protocols.

C.2.20 Greater Sage-Grouse

Summary: An organization requested that the EIS clearly state the presence of direct and indirect impacts resulting from anthropogenic disturbance inside Sage-Grouse Management Areas.

Response: BLM does acknowledge the presence of direct impacts, but also the presence of indirect impacts resulting from anthropogenic disturbance inside the PHMA, GHMA, and OHMA. This was specifically stated in the 2015 ARMPA which is incorporated by reference in the DRMPA.

Summary: A commenter requested that Sage-Grouse population objectives be removed from the Draft EIS.

Response: The Management Alignment Alternative and Proposed Plan Amendment have incorporated language in the RMPA that clarifies that "habitat objectives in the 2015 Final EIS are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Objectives should be based on sources such as ecological site descriptions, associated state-and-transition models." In these alternatives, the BLM is retaining the habitat objectives and they may be modified following the processes outlined by the States, consistent with the purpose and need for this planning effort.

Summary: Wild horses negatively impact Sage-Grouse; BLM should gather excess wild horses within Sage-Grouse habitat.

Response: BLM will continue to work with local, state, and federal stakeholders to address the excess wild horses and burros across the sub-region.

Summary: Manage development on existing leases per regulations already in place. Sage-Grouse near energy development will be more difficult to conserve.

Response: Under the Management Alignment Alternative and Proposed Plan Amendment, oil and gas leases will be managed according to the stipulations outlined in Appendix E of the Draft EIS. BLM will also follow all existing mandates and policies associated with fluid mineral development.

Summary: The EIS must clearly state the benefits that Sage-Grouse receive when livestock are grazed on rangelands with Sage-Grouse habitat and include a description of how predation effects Sage-Grouse populations.

Response: The BLM recognizes the benefits that sage grouse receive from proper livestock grazing, which was analyzed in the 2015 ARMPA and incorporated by reference in this Draft EIS (see Section 4.11). While BLM does not have the authority to carry out certain predator control actions (such as permitting take permits), BLM is committed to working with partners who do, particularly in degraded habitat (recovering burned areas, areas of pinyon and juniper encroachment, etc.) where predators are having a disproportionate impact on local GRSG populations.

Summary: Potential re-listing on the Endangered Species List should be considered when projects result in Undue or Unnecessary Degradation.

Response: Listing determinations are within the authority of the USFWS, therefore, this comment is outside the scope of this planning effort.

C.2.21 Livestock Grazing

Summary: Commenters believe that grazing should be used as a conservation tool for vegetation and fire management and that controlling these will improve Sage-Grouse habitat.

Response: BLM agrees that under certain circumstances, proper livestock management can be an effective conservation tool to reduce the present and widespread threat of fire and invasives to sage grouse within the sub-region. At a programmatic level, the BLM is currently analyzing the use of targeted grazing as a tool to reduce fuel loads through its Programmatic EISs for Fuel Breaks and Rangeland Restoration Treatments across the Great Basin Region (which is currently under development).

Summary: The Draft EIS should analyze the correlation between loss of livestock grazing and vegetation overabundance.

Response: Analyzing the correlation between loss of livestock grazing and vegetation overabundance would be conducted at the site specific allotment level and not at a land use planning level through this effort.

Summary: Grazing should not be considered a primary threat to Sage-Grouse.

Response: Livestock grazing is not considered a primary threat to sage grouse across the entire Nevada and Northeastern California sub-region. However, fire and invasives (as specified in the USFWS Conservation Objectives Team Report, 2013) is a present and widespread threat to populations within the sub-region.

Summary: A Nevada County takes issue with livestock grazing objectives in Section 2.6.2 and Table 2-2, claiming they are inconsistent with its County Plan namely because the objectives do not consider variability in ecological conditions.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, habitat objectives would be based on sources such as ecological site descriptions and associated state-and-transition models.

Summary: Rather than reduce animal unit months (AUMs), BLM should consider spreading cattle to allow moderate grazing and reduced fuel loads across a larger area.

Response: All management tools would be considered on an allotment by allotment basis. The alternatives analyzed in this EIS do not reduce AUMs.

Summary: BLM should remove MD LG 21 from the EIS because it contradicts the 2003 USDI-Solicitor Memorandum.

Response: Modifying MD LG 21 (as presented in the existing ARMPA) is outside the scope of this planning effort, as it does not respond to the effort's overall purpose and need, which is to align with the State of Nevada's Sage Grouse Conservation Plan (2014, as amended).

Summary: The Draft EIS fails to acknowledge or implement a process for Temporary Non-Renewable (TNR) grazing.

Response: BLM has adopted the State of Nevada's adaptive management strategy within the Proposed Plan Amendment (see Appendix D) that identifies Temporary Non-Renewable (TNR) grazing as a potential tool to respond to adaptive management warnings and triggers.

Summary: Any language relating to a reduction in grazing use due to allowable use level must be removed.

Response: Language relating to a reduction in grazing use due to allowable use levels is not incorporated within the proposed actions presented in the Management Alignment Alternative or Proposed Plan Amendment.

C.2.22 Fluid Minerals

Summary: The following was not included in the Draft EIS: "Land with high mineral or oil and gas values shall remain open for economic use."

Response: The comment is outside the scope of this planning effort, as this action would not respond to the purpose and need for this planning effort. The 2015 plans adequately address fluid mineral leasing and its impacts on Greater Sage-Grouse habitats.

C.2.23 Lands and Realty

Summary: Remove the disturbance caps or clarify that they only apply to BLM land, in which case locatable mineral related disturbances are exempt.

Response: Valid existing rights associated with the 1872 Mining Law would be exempt from the disturbance caps contained in the 2015 ARMPA. However, it is important to note that disturbance caps are not being amended through this planning effort and any management actions proposed in the existing 2015 ARMPA and those proposed in the Management Alignment Alternative (Proposed Plan Amendment) would only be applied to BLM administered lands.

C.2.24 Socioeconomics

Summary: The socioeconomic impacts analysis is inadequate and fails to calculate detailed economic and fiscal impacts to Counties and mining companies as well as mitigation to those impacts.

Response: Within the Draft EIS and Final EIS, the BLM has incorporated by reference the socioeconomic effects analysis contained in the 2015 Final EIS and the 2016 Draft EIS associated with the proposed SFA withdrawal. At a land use planning level, BLM has determined that this level of analysis is adequate.

Summary: BLM should work with UNR during this analysis; the university has a Socioeconomic Baseline Data collection process for the entire state and is performing a socioeconomic and fiscal impacts analysis for the GSGR plans independently.

Response: The Socioeconomic Baseline Data Report referenced by the commenter is still under development and will not be completed in time for incorporation into this document. However, BLM has included a statement in Section 4.4 *Incomplete or Unavailable Information* of the Final EIS that specifies this. In addition, BLM does plan to work with UNR in the completion of this baseline document.

Summary: BLM opted to conduct a qualitative analysis despite economic impact information given to BLM through locally sourced data and reports.

Response: At a land use planning level, BLM has determined that the qualitative level of analysis conducted in the Draft EIS is adequate, including the incorporation by references from the 2015 Final EIS and the 2016 Draft EIS associated with the proposed SFA withdrawal.

Summary: Increase Payments in Lieu of Taxes (PILT) to offset economic impacts to local governments, Counties, and States.

Response: Increase Payments in Lieu of Taxes (PILT) to offset economic impacts to local governments, Counties, and States is outside the scope of this planning effort.

Summary: The environmental impacts of increased mining outweigh the little economic benefit to local communities of a temporary labor force.

Response: Socioeconomic analysis relating to sage grouse conservation can be found in Section 4.10 of the Final EIS.

Summary: The analysis of economic effects should include liability of costs for takings of private property, especially regulatory decisions that prevent ranches from accessing and using existing property rights within federally controlled lands.

Response: Liability of costs for takings of private property would not be impacted by the proposed decisions outlined in the Management Alignment Alternative.

Summary: Hard triggers are an unreasonable burden on the economic security of Nevada Counties; soft triggers should be implemented only when necessary, considering all factors.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, immediate hard trigger responses in the form of land use plan allocation decisions have been removed. Soft trigger responses will be implemented at the implementation level, consistent with the Adaptive Management Strategy presented in Appendix D of this Final EIS.

C.2.25 Vegetation

Summary: The EIS should include discussion of conifer removal as a beneficial treatment to wildlife and other vegetation.

Response: Information on conifer removal effects on GRSG was analyzed in the 2015 Final EIS (which has been incorporated by reference in the Draft EIS and Final EIS, see Section 4.6). In addition, acres of treatment in the Draft RMPA were disclosed from 2015-2017 in Section 3.4 of the Draft EIS and Final EIS. These treatments did include conifer removal.

Summary: Vegetative management should focus on diversity of vegetation and be revised to include criteria for rangeland health and GRSG habitat and consider selective grazing.

Response: The 2015 Final EIS (which has been incorporated by reference in the Draft EIS and Final EIS) includes information on vegetation management and rangeland health. Selective grazing is still an available tool that the BLM can apply on an allotment by allotment basis.

C.2.26 Travel and Transportation

Summary: BLM should provide flexibility for manager discretion for off road vehicle use to manage range improvements and livestock. Travel restrictions should not impact the ability of permittees to access and manage allotments and livestock.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, BLM has incorporated a list of criteria (situations) in which an exception to an allocation decision tied to PHMA, GHMA, and OHMA (such as the allocation to limit travel to existing roads/routes) would be permitted if the criteria is met and as approved by the BLM's State Director (see Chapter 2, Allocation Exceptions).

Summary: Travel management appears to be carried over from the 2015 plan and not fully analyzed in this plan.

Response: Analysis from the range of alternatives analyzed in the 2015 Final EIS has been incorporated by reference in the Draft EIS and Final EIS. The commenter is correct that management actions tied to comprehensive travel management did not change across the alternatives analyzed in this EIS, however, based on the habitat management area mapping changes for PHMA, GHMA, and OHMA between the alternatives, the acres of public land limited to existing routes did slightly decrease across the sub-region and analysis from this proposed action can be found in Section 4.12.2.

Summary: One County is concerned that travel restrictions interfere with the county's development goals and will restrict access on roads and public lands.

Response: Within the Management Alignment Alternative and Proposed Plan Amendment, BLM has incorporated a list of criteria (situations) in which an exception to an allocation decision tied to PHMA, GHMA, and OHMA (such as the allocation to limit travel to existing roads/routes) would be permitted if the criteria is met and as approved by the BLM's State Director (see Chapter 2, Allocation Exceptions).

Summary: Travel management restrictions cannot interfere with ingress and egress rights for the purpose of exploring for or developing minerals.

Response: The alternatives analyzed within this EIS do not include proposed management that would interfere with ingress and egress rights for the purpose of exploring for or developing minerals subject to the Mining Law, as all management actions proposed in the alternatives would be subject to valid existing rights, including those associated with the 1872 Mining Law.

C.2.27 Renewable Energy

Summary: Removal of lithium deposits will impede the nation's ability to develop renewable energy resources.

Response: Under the Management Alignment Alternative and Proposed Plan Amendment, no areas would be recommended for withdrawal and all proposed actions within these alternatives are subject to valid existing rights, including those associated with the 1872 Mining Law.

C.2.28 Cumulative Effects

Summary: BLM fails to analyze fully the potential cumulative impacts to Sage-Grouse and respective habitats.

Response: The cumulative effects analysis contained in the Draft EIS has been updated to incorporate range-wide WAFWA Management Zone quantitative cumulative effects analysis to sage grouse. See Section 4.13 within the Final EIS.

Summary: The cumulative impact analysis from the 2015 LUPA is not an adequate analysis for the current analysis.

Response: The cumulative effects analysis contained in the Draft EIS has been updated to incorporate range-wide WAFWA Management Zone quantitative cumulative effects analysis to sage grouse. See Section 4.13 within the Final EIS.

Summary: Review the list of projects in Table 4-5 to ensure they fully consider "incremental impacts when added to the past, present, and reasonable foreseeable future actions."

Response: BLM has reviewed the list of projects in Table 4-5 to ensure they fully consider incremental impacts when added to the past, present, and reasonable foreseeable future actions.

Summary: BLM must identify the present effects of past actions, more specifically, cumulative impacts of the 2015 plans.

Response: Table 4-5 in the Draft EIS contained a full list of past, present, and reasonably foreseeable actions which were used to develop the cumulative effects analysis contained in Section 4.13 of the Draft EIS.

Summary: One commenter specifically expressed concern about dismissal of predators and Wild Horses and Burros as substantial impacts.

Response: Wild horse & burros and predation were not carried forward for further analysis due to the determination that this EIS/Amendment would not alter the management direction for wild horse & burros as analyzed in the 2015 ARMPA.

C.3 RANGEWIDE COMMENTS

C.3.1 Adaptive Management

Adaptive management provisions such as "hard" and "soft" triggers must be maintained, along with provisions for public notice and comment when they are triggered, to show that monitoring of effectiveness is ongoing and management is adjusted as needed.

In sum, designated PHMAs should be expanded to all lands designated as PACs by the US Fish and Wildlife Service in 2013 (COT 2013), and include expansions of Core Areas adopted by the State of Wyoming in 2015. In turn, SFA status and management parameters should be expanded to all lands designated as PHMA if the BLM truly wants to protect and conserve sage-grouse throughout its range and the Plans are being used to defer ESA listing.

C.3.2 Alternatives - Other

In sum, designated PHMAs should be expanded to all lands designated as PACs by the US Fish and Wildlife Service in 2013 (COT 2013), and include expansions of Core Areas adopted by the State of Wyoming in 2015. In turn, SFA status and management parameters should be expanded to all lands designated as PHMA if the BLM truly wants to protect and conserve sage-grouse throughout its range and the Plans are being used to defer ESA listing.

C.3.3 Assumptions and Methodology

The analytical assumptions in the DEISs are neither reasonable nor supportable At the beginning of Chapter 4, each DEIS lays out a series of analytical assumptions. The purpose of these assumptions is to set guidelines and provide reasonably foreseeable projected levels of development that would occur in the planning area during the planning period. As shown below, however, many of these assumptions are neither reasonable nor supportable when looked at objectively, and considering the most recent science. ? Assumption One: Sufficient funding and personnel would be available for implementing the final decision. ? Table ES-1 in each Executive Summary of the DEISs shows a significant decline in all planned habitat restoration and protection activities for FY 18, including conifer removal and invasive species removal. However, invasive species removal is already falling far behind the pace needed to adequately restore sagebrush habitat, as shown in a recent WAFWA report (WAFWA Gap Analysis) finding that most invasive weed management programs are addressing less than 10% of the average infested acres, while the annual rate of spread of invasive plants, can range from 15-35%. That document states, "[This] [l]ack of effort is due almost entirely to lack of capacity, not expertise."14 ? In FY 19, The Administration budget request for funding sage-grouse would impose further cuts by consolidating the sage-grouse program with other programs and reducing the total amount sought.15 ? Interior Secretary Zinke has told lawmakers that he wants to reduce the Department workforce by 4,000 full-time jobs.16(Greenwire 8/15/17) ? Assumption Two: Implementation-level actions necessary to execute the LUP-level decisions in this RMPA/EIS would be subject to further environmental review, including that under NEPA. ? Instruction Memorandum (IM) 2018-034, recent guidance issued by BLM governing oil and gas leasing, emphasizes using Determinations of NEPA Adequacy instead of NEPA analysis. ? IM 2018-061 instructs BLM staff members to ensure they are using several tools to make the NEPA process more efficient, including categorical exclusions for certain types of oil and gas development. ? Pending legislation, H.R. 6106, introduced by Representative Pearce (R-NM), would require use of categorical exclusions from NEPA for many oil and gas drilling activities. ? Pending legislation, H.R. 6088, introduced by Representative Curtis (R-UT), would allow oil and gas companies to obtain authorization to drill in

some circumstances without NEPA analysis. ? Pending legislation, S.1417, introduced by Sen. Hatch (R-UT) and Sen Heinrich (D-NM), would create categorical exclusions for a wide variety of sage-grouse management activities, such as the use of herbicides and pesticides, mechanical piling and burning, chaining, and broadcast burning. ? There has been a large increase in the use 5of categorical exclusions from NEPA analysis for oil and gas development in Wyoming, particularly in the Continental Divide-Creston Project Area, where categorical exclusions allowed by section 390 of the Energy Policy Act of 2005 (42 U.S.C. § 15942) are being employed. ? Assumption Three: Direct and indirect impacts of implementing the RMPA/EIS would primarily occur on public lands administered by the BLM in the planning area. ? The DEISs loosen restrictions on oil and gas development on BLM lands in a variety of ways, such as decreasing buffers, removing or modifying disturbance and density caps, opening new areas to development, and eliminating general habitat in Utah. While BLM assumes that impacts would primarily occur on public land, recent scientific research indicates the likelihood of impacts to adjoining private or public lands owned by agencies other than BLM. This study, by Spence et al., found that the probability of lek collapse was positively related to the density of oil and gas wells located outside of core areas at two distances - within 1.6 km and within 4.8 km of the core area boundary.17 ? These proposed changes would impact future collaborative processes, as expressed by Wyoming Governor Matt Mead: "If we go down a different road now with the sage grouse, what it says is, when you try to address other endangered species problems in this country, don't have a collaborative process, don't work together, because it's going to be changed," Mead said. "To me, that would be a very unfortunate circumstance."18 ? Assumption Four: The BLM would carry out appropriate maintenance for the functional capability of all developments. ? As noted in Assumption One, BLM is already not carrying out appropriate maintenance, and potential budget cuts foretell even greater deficiencies in the future. Moreover, the mere fact that treatment has occurred does not necessarily indicate that the habitat has successfully been restored, rendering Table ES-1 essentially meaningless. As the 2018 USGS Synthesis of recent scientific research states, "Restoring sagebrush communities can be difficult, costly and slow."19 ? In Desert Survivors v. U.S. Dept. of the Interior, Case No. 16-cv-01165-JCS (N.D. CA May 15, 2018)20, in ruling that the FWS erred in failing to list the bi-state GRSG population under ESA, the court held, "the service must offer some rational basis for its conclusions that future conservation efforts will be effective enough to improve the status of the bi-state (grouse) and therefore warrant withdrawal of the proposed listing." Id. at 64. Assumptions must have a basis in fact. ? Assumption Five: The discussion of impacts is based on best available data. ? In Chapter 4, the DEISs acknowledge that much important data is not available, including comprehensive planning area-wide inventory of wildlife and special status species occurrence and condition and GIS data used for disturbance calculation on private lands. Indeed, the DEISs acknowledge that some impacts of the proposed changes could not be quantified.21 ? CEQ regulations further require, where data is unavailable a summary of existing scientific evidence relevant to evaluating reasonably foreseeable significant adverse impacts and the agency's evaluation of such impacts.22The DEISs fail to provide either of these types of information. ? In addition to failing to include the results of the WAFWA Gap Analysis, the DEISs also do not consider a study published in PLoS ONE by Kitzberger et al. (PLoS ONE study) finding that many parts of the West can expect to see more than five times the area burned during the next 20 years than fires covered in the past 20.23 The DEISs state that their assumptions apply to the analysis of both alternatives presented by BLM. It is not appropriate, however, to rely on assumptions, as BLM has done here, that are not based either in fact or sound science.

III. THE ASSUMPTIONS, DATA, AND PLANNING CRITERIA BLM RELIES ON IN THE DRAFT EISs ARE FLAWED. There are significant problems in the DEISs relating to the assumptions, data, and

planning criteria BLM uses in support of the proposed amendments to the 2015 land use plans. These flaws lead to a series of inadequacies in the DEISs themselves, including both faulty conclusions and a high degree of regulatory uncertainty as to the meaning of the proposed amendments, discussed in detail below. A. The analytical assumptions in the DEISs are neither reasonable nor supportable At the beginning of Chapter 4, each DEIS lays out a series of analytical assumptions. The purpose of these assumptions is to set guidelines and provide reasonably foreseeable projected levels of development that would occur in the planning area during the planning period. As shown below, however, many of these assumptions are neither reasonable nor supportable when looked at objectively, and considering the most recent science.

C.3.4 Cumulative Impacts

F. BLM's cumulative impacts analysis is insufficient and invalid. The BLM is required to consider the cumulative environmental impacts to sage-grouse and sage-grouse habitat in the EISs it has prepared. Cumulative environmental impacts are defined as: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. 40 C.F.R. § 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Id. Cumulative impacts must be considered in the scope of an EIS. Id. § 1508.2(c). Despite the requirement to consider cumulative environmental impacts in the sage-grouse land use plan amendment EISs, the BLM has failed to do this adequately. For one, the BLM claims that the cumulative effects analysis from the 2015 sage-grouse land use plan amendments meets the cumulative effects analysis requirement that is needed now. The inappropriateness and legal invalidity of this claim is discussed elsewhere in these comments. As noted above, tiering is only appropriate when a subsequent narrower environmental analysis relies on an earlier broader environmental analysis. See 40 C.F.R. § 1508.28 (a) (stating that tiering is appropriate when a program, plan, or policy environmental impact statement is used to support a new analysis of "lessor scope" or which is site-specific). But we do not have that here; the scope of the current analysis is as broad as the 2015 analysis. There is no "step down" present here, therefore the cumulative impacts analysis from the 2015 plans cannot "incorporate[ ] by reference the analysis in the 2014 and 2015 Final EISs and the 2016 Draft Sagebrush Focal Area Withdrawal EIS." Wyoming DEIS at 4-20. In addition, BLM cannot simply incorporate the previous analysis by reference without justifying how it is appropriate and summarizing how it applies, neither of which has been done in the Draft EISs. See, 43 C.F.R. § 46.135(a). BLM also must ensure any incorporation by reference does not impede review by the public, which it surely does here. See 40 C.F.R. § 1502.21. Moreover, the purpose and need for the 2018 EISs differs from that of the 2015 EISs, which underscores why neither tiering nor incorporation by reference is appropriate.

Secondly, in each of the six 2018 EISs the BLM lists a number of projects that it claims reflect the cumulative effects impacts that are applicable here. See, e.g., Table 4-3 in the Wyoming Draft EIS (DEIS). But this list of projects fails to incorporate many relevant projects that should be considered in the cumulative effects analysis. In Wyoming, for example, neither the Normally Pressured Lance or Converse County oil and gas projects are listed. See Wyoming DEIS at Table 4-3, page 4-35. These are two mammoth projects, that will involve drilling thousands of oil and gas wells which will have significant impacts on sage-grouse and sage-grouse habitats.11 Neither of these projects were considered in the 2015 EISs. In Utah the Greater Chapita Wells Natural Gas Infill Project is not considered in the Utah sage-grouse plan amendment EIS. Utah DEIS at Table 4-4, pages 4-41 to 42. This project could involve the drilling of 2808 natural gas wells in Uintah County, which is prime sage-grouse habitat. See

https://eplanning.blm.gov/epl-frontoffice/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=3736 2. There are other projects missing from the Range Wide Impacts from Past, Present, and Reasonably Foreseeable Future Actions table in the other states. In addition, while in Wyoming (and the other states), past and upcoming oil and gas lease sales are mentioned, see Wyoming DEIS at Table 4-3, page 4-35, the list is incomplete. The June lease sale(198,588 acres) is mentioned but neither the upcoming September (366,151 acres) or December (698,589 acres) lease sales are discussed.12 The same is true in other states. For example, in Utah, the Utah DEIS says 646 acres of oil and gas leases will be offered in Habitat Management Areas (HMA) in June, but it fails to mention the 158,944 acres (with 45,227 acres that had been previously offered) that will be offered for lease in September.13 The same is true in other states.

The BLM should review the list of projects shown in Tables 4-3 or 4-4 (depending on the state) causing cumulative impacts and ensure they are as comprehensive as is required to include "the incremental impact[s] . . . when added to other past, present, and reasonably foreseeable future actions." We note again the projects we have mentioned were not considered in the 2015 sage-grouse plan amendment EISs. These are "collectively significant actions taking place over a period of time" that must be considered in the cumulative impacts analysis, but which have not been. In addition, BLM should evaluate the cumulative effects of these projects across the planning areas of the 2015 Sage-grouse Plans. Under Council on Environmental Quality (CEQ) guidance, BLM must consider the current aggregate effects of past actions in a cumulative impacts analysis. CEQ, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (available at https://ceq.doe.gov/docs/ceq-regulations-andguidance/regs/Guidance_on_CE.pdf). This means the BLM must consider what the impacts of implementing the 2015 plans has been on cumulative impacts. BLM cannot just incorporate the 2015 plans by reference as its cumulative effects analysis, rather it must consider the "identifiable present effects of past actions," which the 2015 plans clearly are. Under the 2015 plans BLM has taken hundreds of actions, and in total those actions have had cumulative environmental impacts. An analysis of those cumulative impacts is missing from the current EISs, which is not permissible. "A cumulative impact analysis "must be more than perfunctory; it must provide 'a useful analysis of the cumulative impacts of past, present, and future projects.'"" N. Plains Res. Council, Inc. v. Surface Transp.Bd., 668 F.3d 1067, 1076 (9th Cir. 2011) (quoting Kern v. U.S. Bureau of Land Mgmt., 284 F.3d 1062,1075 (9th Cir. 2002) (additional citation omitted). "To be useful to decision makers and the public, the cumulative impact analysis must include "some quantified or detailed information; . . . general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided."" 668 F.3d at 1076 (quoting Ocean Advocates v. U.S. Army Corps of Eng'rs, 402 F.3d 846, 868 (9th Cir. 2004) (additional citation omitted). Here the BLM has offered nothing more than a perfunctory cumulative impacts analysis. There is no useful analysis of past projects; the dozens if not hundreds of approved projects implementing the 2015 sage-grouse plans. There is no quantifiable or detailed information about those projects, and there are not even any general statements about the cumulative impacts of those projects, many of which have undergone a NEPA analysis. Based on the above, it is evident the cumulative impacts analyses in the 2018 Draft EISs is invalid and must be expanded to fully address the cumulative impacts from the amendments.

C.3.5 Data and Science

A 2016 Wyoming study by Smith et al.33cited in both the USGS Annotated Bibliography and the ZUSGS Synthesis found that sage-grouse frequently used winter habitats outside of core areas. The Annotated

Bibliography summarizes the implications of this study: Current seasonal use restrictions in winter concentration areas (December 1 to March 15) are shorter than the GRSG winter habitat use period identified in the study. A substantial proportion of winter use areas were located outside of identified core areas in one of the two study areas, suggesting reconsideration of the ability of Wyoming's Core Area policy to provide for long-term conservation of GRSG. While the Wyoming DEIS refers to potential changes to Habitat Management Area Designations (See, e.g., WY DEIS at 4-14-4-15), neither this study nor the need to expand winter habitat is mentioned. ? A second Wyoming study by Spence et al.35found the probability of lek collapse was positively related to the density of oil and gas wells located outside core areas at two distances - within 1.6 km and within 4.8 km of the core area boundary. The USGS Annotated Bibliography states: The proportion of the male population within core areas and the observed decreased probability of lek collapse within core areas suggest that the core area policy is providing broad protection for GRSG in Wyoming. However, limitations on development near core areas may be needed to more effectively protect GRSG populations within core areas.36 The Wyoming DEIS again makes no mention of this study, and in fact proposes reducing noise restrictions outside priority habitat (WY DEIS at 2-12-2-13), while other DEISs in other states, such as Utah and Idaho, eliminate a variety of restrictions outside but adjacent to priority habit (see e.g., UT DEIS at 2-6; ID DEIS at 2-10).

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We appreciate the idea that broad, science-based objectives have a place in determining whether greater sage-grouse habitat is contributing to stable populations. However, no single objective can cover the wide range of variability that occurs across a landscape as vast as the sagebrush sea. The Habitat Objectives Tables (Table 2-2) have been misinterpreted as standards that must be met, likely at the expense of the widest and most adaptable use in the West-livestock grazing. It does not make sense that these objectives be reflected in livestock grazing permittee/lessee terms and conditions if they do not fit the ecosystem in which they are being applied. Because of this, we appreciate those amendments that propose to make clear that habitat objectives must account for local conditions and site variability. This includes the removal of the seven-inch perennial grass and forb height habitat objective. We understand why grass and forb height objectives need to be considered for the health of the bird, but we believe these objectives should vary across the range. We request these changes be made to the habitat objectives tables for each greater sage-grouse RMP amendment.

By ignoring the WAFWA Gap Analysis and Plos ONE study, the DEISs fail to recognize the warning that occurs later in the USGS Synthesis, which states: [T]here continues to be emerging science quantifying effects and measuring the efficacy of conservation recommendations. Review of this new information as it becomes available, and incorporating changes, if appropriate, are essential to implementing valid conservation recommendations.32

In addition to the problems with Table ES-1 noted above in the first section, the figures used in the Table and on page 3-1 are of limited utility at best because they are not broken down either state by state or by sage-grouse management zone. Range-wide data can mask significant decreases in habitat or population in a more localized area. In addition, no citation is provided for either data set so that the numbers provided can be examined and verified. ? The PLoS ONE study found that median increases in AAB (Annual Area Burned) greater than 700% are predicted for ID, MT, and NV, and strong upper quartile increases are predicted for OR, ID, MT, and WY. In many areas the actual burning on the ground has exceeded the models. This is a huge increase from the conclusion in the 2015 FWS sage-grouse listing decision that that wildfire would continue to affect the Great Basin at the current rate of about 85% percent per year.29

In discussing the findings of the Synthesis on impacts of activities such as oil and gas development to sage-grouse habitat, the DEIS states: The science developed since 2015 corroborates prior knowledge about the impact of discrete human activities on Greater Sage-Grouse. New science suggests that strategies to limit surface disturbance may be successful at limiting range-wide population declines; however, it is not expected to reverse the declines, particularly in areas of active oil and gas operations ([Synthesis], p.2). This information may have relevance when considering the impact of management actions designed to limit discrete disturbances.31 The studies referenced in this passage appears to be set out on page 14 and 15 of the USGS Synthesis. We were not able to locate a single instance in any of the DEISs, however, where any of these papers were cited in a discussion of the Impacts of the BLM Preferred Alternative in the DEISs.

The DEISs ignore studies referenced in the USGS Annotated Bibliography and USGS Synthesis that either support additional protections for sage-grouse habitat or provide evidence against the amendments BLM proposes.

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The WAFWA Gap Analysis shows that invasive plant infestations in the West, particularly in the range of the sage-grouse, have reached enormous levels with estimates of invasive annual grass and perennial forb infestations at more than 100 million acres of public and private lands. Again, this is far more than contemplated in the FWS sage-grouse listing decision.30

A limit of 3% human surface disturbance per square-mile section is the minimum necessary standard for preventing habitat abandonment by sage grouse. Knick et al. (2013) found that 99% of active leks across the western half of the sage grouse's range were surrounded by land with 3% or less human development. Decker et al. (2017) found a similar result in Colorado, with a linear decrease in sage

grouse lek populations once surface disturbance increased above the 2.5% threshold. Preliminary results from Kirol et al. (in prep) indicate that the vast majority of sage-grouse were found in habitats with <1% surface disturbance. Disturbance density can also affect survival, Kirol et al. (2015a) found that brood survival for sage-grouse began to decline significantly once disturbance density hit the 4% threshold. The vast majority were surrounded by much less disturbance. Copeland et al. (2013) found that if all of the State of Wyoming sage grouse policy provisions (which include a 5% disturbance cap calculated using a Disturbance Density Calculation Tool) were implemented fully and to the letter, that a 9 to 15% decline in greater sage grouse populations would still occur statewide, including a 6 to 9% decline within designated Core Areas (where the 5% disturbance cap would be applied). There is no scientific evidence at all indicating that sage grouse can tolerate a greater percentage of surface disturbance. In particular, the 5% cap on disturbance proposed for the Wyoming RMP amendment for Core Areas and Connectivity Areas been shown to be effective by no scientific study, ever.

The data BLM chose to rely upon is insufficient. The scientific grounding for the BLM plans, including the level of certainty in how they are applied, was a key part of the foundation for the FWS decision that listing the sage-grouse under ESA was not warranted.24 Any changes proposed to the plans now by the BLM should meet a similarly high standard, complying with both the CEQ regulations and considering all the most recent peer-reviewed research. Unfortunately, here, much of the relevant data is not available, and the data BLM has ignored includes important studies that would argue against many of the changes BLM proposes in the DEISs. Table ES-1 of the DEISs purports to use the amount of on-the-ground treatment activity for the past three fiscal years, as well as planned activities for the current fiscal year, to show progress in sagebrush habitat restoration. In addition, every DEIS also includes the following language on page 3-1: While the BLM acknowledges that there have been changes to the landscape since 2015, due to the scale of this analysis… data collected consistently across the range indicate that the extent of these changes to the landscape are relatively minimal. For example, BLM monitoring data collected and analyzed annually at the biologically significant unit (BSU) scale… indicates that there has been a minimal overall increase in estimated disturbance (less than 1 percent range-wide from 2015 through 2017) within PHMA. Moreover, there has been an overall decrease in sagebrush availability (less than 1 percent range-wide from 2012 through 2015) in PHMAs within BSUs. Finally, Chapter 3 of every DEIS references both the USGS annotated bibliography of scientific research on greater sage-grouse published since January 201525 (USGS Annotated Bibliography) and the USGS report that synthesizes and outlines potential management implications of the new science.26 (USGS Synthesis). These data are intended to show that changes to the landscape since the 2015 plans are "relatively minimal."27 In addition, the DEISs state: Based on available information, including [the Annotated Bibliography and Synthesis], the BLM has concluded that the existing condition is not substantially different from that of 2015; therefore, the data and information presented in the 2014 and 2015 Final EISs are incorporated into this RMPA/EIS.28 Both conclusions are faulty. Changes to the landscape since 2015 are not relatively minimal, and the sagebrush landscape of 2018 is not substantially similar to that of 2015, as shown below.

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Holloran (2005) found that several types of oil and gas infrastructure sited within 1.9 miles of the lek site had a negative impact on populations of breeding males on the lek; these infrastructure feature include both wellpads during the post-drilling, production phase and gravel trunk roads leading to five or more wellpads. It is important to note that a single wellpad or road can cause significant impacts, and these impacts occur even in cases where roads are not visible from the lek site due to intervening terrain (Holloran 2005). Drilling activities can have significant impacts when wells are sited within 3 miles of leks (id.). Manier et al. (2014) reviewed all available science and found that appropriate lek buffers (the "interpreted range") ranged from 3.1 to 5 miles. Aldridge and Boyce (2007) suggested that even larger buffers (10 km) are warranted. In addition to significant negative impacts on breeding populations at the lek site, industrial incursions can also have a significant negative impact on nesting females. The lek is the hub of nesting activity, with most females nesting within 4 to 6 miles of a lek site. Holloran et al. (2007) found that yearling sage grouse avoided otherwise suitable nesting habitat within 930m (almost 0.6 mile) of oil and gas-related infrastructure. This means that individual wellsites, and their access roads and other related facilities, will be surrounded by a 0.6-mile band of habitat that has substantially lost its habitat capability for use by nesting grouse. The National Technical Team (2011: 20) observed, "it should be noted that protecting even 75 to >80% of nesting hens would require a 4-mile radius buffer (Table 1). Even a 4-mile NSO buffer would not be large enough to offset all the impacts reviewed above." Importantly, a 0.6-mile lek buffer covers by area only 2% of the nesting habitat encompassed by a 4-mile lek buffer, which takes in approximately 80% of nesting grouse according to the best available science.

Priority Habitats were largely designated on the basis of buffers around active lek sites, which encompass the breeding and nesting habitats used by grouse during spring and summer. But protecting wintering habitats is equally important to assuring the continued existence and ultimate recovery of the species, and these wintering habitats are frequently located outside the protective boundaries of designated Priority Habitats (see, e.g., Smith et al. 2016, Dinkins et al. 2017). For Wyoming, Dinkins et al. (2017: 10) state, "Although breeding habitat-defined as the area within 8.5 km [5.3 miles] of a lek-was a good surrogate for delineating all seasonal habitats for sage-grouse, Core Areas provided habitat protections disproportionately for summer habitats compared to winter." These researchers went on to state, "our mapping results demonstrated that net reproduction from all birds associated with a winter habitat magnifies the importance of maintaining high-quality winter habitat. In other words, birds breeding outside of winter habitats were reliant on winter habitats for winter survival; thus, degraded winter habitat could equate to loss of reproduction from a much larger spatial footprint.

Recent empirical study confirms the established finding that sage-grouse lek attendance is negatively related to oil and gas density, regardless of sagebrush cover and participation.3 Green et al. (2017) examined greater sage-grouse lek attendance, oil and gas well, and habitat and precipitation data from Wyoming over the period 1984 to 2008, and, consistent with numerous prior studies, that lek

attendance declines are closely associated with the density of oil and gas development: Oil and gas development correlates well with sage-grouse population declines from 1984 to 2008 in Wyoming, which is supported by other findings (Doherty et al. 2010b, Harju et al. 2010, Hess and Beck 2012, Taylor et al. 2013, Gregory and Beck 2014). As with other studies, we also found support for 4-year lag effects of oil and gas development on lek attendance (Walker et al. 2007, Doherty et al. 010a, Harju et al. 2010, Gregory and Beck 2014). This result suggests that development likely affects recruitment into the breeding population rather than avoidance of wells by adult males or adult survival. Adult sage-grouse are highly philopatric to lek sites (Dalke et al. 1963, Wallestad and Schladweiler 1974, Emmons and Braun 1984, Dunn and Braun 1985, Connelly et al. 2011a), and males typically recruit to the breeding population in 2-3 years. We would expect a delayed response in lek attendance if development affects recruitment, either by reducing fecundity or avoidance of disturbance by nesting females, as adult males die and are not replaced by young males.

Sagebrush Focal Areas ("SFAs") are by definition a subset of PHMA, where all PHMA direction applies with additional protections overlaid in some cases. Our organizations agree with the need for modification insofar as we believe SFA management actions should be expanded to more lands. In addition, we believe that all priority habitats, including SFAs must be designated as sage-grouse Areas of Critical Environmental Concern (ACECs) and managed to protect sage-grouse, as discussed in more detail above. The current Greater Sage-Grouse RMP Amendments and Revisions incorporate insufficient Priority Habitat Management Area designations in all states except Oregon, Colorado, and North Dakota. Crist et al. (2015) provided a critique that indicated that many PHMA units were too small and isolated to sustain sage-grouse populations over the long term, and also noted that a handful of large areas are strongholds of disproportionate importance to sage-grouse conservation efforts. All lands designated as Priority Areas for Conservation 65 ("PACs") by the U.S. Fish and Wildlife Service need to be designated as Priority Habitat Management Areas and given strong, science-based protections in accord with the recommendations of the National Technical Team. In addition, expansions of PHMA are warranted in Wyoming, where the BLM and U.S. Fish and Wildlife Service erroneously incorporated reductions in state Core Area designations that were made for political, rather than scientific, proposes, and which render this state's Priority Habitat Management Areas scientifically invalid.

Scientific research has determined that one energy site per square mile is the density threshold at which significant impacts to sage-grouse populations begin to be measured (Copeland et al. 2013). Tack (2009) found that this study in Montana's Milk River Basin, well densities of one per square mile also we correlated with a very low probability of a lek being large (see Figure 9, p. 43). The analysis of Copeland et al. (2013) found that a statewide analysis 72 of well densities revealed population decline curves very close to the earlier studies by Holloran (2005), but also noted that a 1 wellpad per square mile density of development correlated to approximately 18% decline in sage grouse lek population (see Figure 4). So one wellpad per square mile definitely is not a zero-impact threshold. Indeed, Garman (2018) found that clustering 8 wells per pad using directional drilling in the Atlantic Rim coalbed methane project, which would meet the one-pad-per-square-mile threshold required for PHMA, still left comparatively little habitat within the Project Area outside the ecological zone of influence of roads and wellpads. This one-site-per-square- mile-section is a threshold that should not be subject to waiver, modification, or exception.

The BLM's own experts recommended for existing fluid mineral leases that a 4-mile No Surface Occupancy buffer should be applied to leks, with an exception allowed in cases where the entire lease is

within 4 miles of a lek, in which case a single wellsite should be permitted in the part of the lease most distal to the lek (NTT 2011). This recommendation is reinforced by a similar recommendation from western state agency biologists, who also recommended a 4-mile No Surface Occupancy buffer (Apa et al. 2008). According to Taylor et al.(2012: 27), in a study commissioned by BLM, 68 Second, female sage-grouse that visit a lek use an approximately 9-mi (15-km) radius surrounding the lek for nesting; a 2-mi (3.2-km) radius encompasses only 35-50% of nests associated with the lek (Holloran and Anderson 2005, Tack 2009). While a lek provides an important center of breeding activity, and a conspicuous location at which to count birds, its size is merely an index to the population dynamics in the surrounding habitat. Thus attempting to protect a lek, without protecting the surrounding habitat, provides little protection at all.

The studies referenced in this passage appears to be set out on page 14 and 15 of the USGS Synthesis. We were not able to locate a single instance in any of the DEISs, however, where any of these papers were cited in a discussion of the Impacts of the BLM Preferred Alternative in the DEISs. ? By ignoring the WAFWA Gap Analysis and Plos ONE study, the DEISs fail to recognize the warning that occurs later in the USGS Synthesis, which states: [T]here continues to be emerging science quantifying effects and measuring the efficacy of conservation recommendations. Review of this new information as it becomes available, and incorporating changes, if appropriate, are essential to implementing valid conservation recommendations.32 ? The DEISs ignore studies referenced in the USGS Annotated Bibliography and USGS Synthesis that either support additional protections for sage-grouse habitat or provide evidence against the amendments BLM proposes.

There is a substantial body of scientific literature concluding that discrete anthropogenic activities that are present in sagebrush have negative effects on sage-grouse. The extent of these effects varies based on the size, intensity and persistence of the human activity, and can range from displacement to local extirpation of sage-grouse.73 Nonrenewable energy developments, such as fluid mineral leasing, and their supporting infrastructure are a pervasive, and in some cases an increasing presence within the range of sage-grouse.74 There has, however, been a gradual decrease in recommended requirements for fluid mineral leasing within priority areas. * 2011 NTT Report75: For unleased federal fluid mineral estate, close priority areas with very limited exceptions. For leased federal areas, do not allow new surface occupancy in priority habitat, with limited exception. Proposed surface disturbance cannot exceed 3% with limited exception. Disturbance measured within individual priority areas and local project area.76 * 2013 COT Report77: Avoid development in priority areas; identify areas where leasing is not acceptable. If avoidance not possible, development should occur only in non-habitat areas or 72 U. least suitable habitat. Reduce and maintain density of energy structures below which there are no impacts to sage-grouse habitats or do not result in declines to sage-grouse populations.78 * 2015 BLM Plans79: Implement disturbance cap of 3% within individual priority areas and local project area in priority habitat. Implement a density cap of an average of 1 energy and mining facility per 640 acres.80 * 2018 BLM Proposed RMPA.EIS: Numerous additional waivers, exceptions and modifications for drilling in priority areas; restrictions on drilling limited; for Utah, if project design and site conditions indicate a project will improve habitat, exceedances of disturbance and density caps at either project level or individual priority area are allowed.; in Idaho disturbance cap only measured for individual population areas, not project area.81 The 2015 finding by the Fish and Wildlife Service that Greater Sage-Grouse did not need to be listed under the ESA relied heavily on the provisions in the 2015 BLM plans: As previously stated, sage-grouse are sensitive to disturbance, and small amounts of development within sage-grouse habitats can negatively affect sage-grouse population viability. Thus, limiting future

disturbances in sage-grouse habitats is an essential component of reducing or eliminating effects related to disturbance, as recommended in the COT Report.82 In addition to the NTT and COT reports, numerous research papers confirm the importance of density and disturbance caps: * 2017 Edmunds study: Modeled density-independent and -dependent population growth across multiple spatial scales relevant to management and conservation. Relatively close fine-scale populations of sage-grouse can trend differently, indicating that large-scale trends may not accurately depict what is occurring across the landscape (e.g., local effects of gas and oil fields may be masked by increasing larger populations). 83 * 2017 Green study (importance of caps): Best models indicated that GRSG responded to energy development with a 1 to 4-year time lag, and well density within 6,400 m of leks best explained GRSG losses. Sagebrush cover and precipitation explained little variation in lek attendance over time. Across Wyoming, decreases in lek attendance were significant at a density of 4 wells per square kilometer, reaching 17 percent per year at 5.24 wells per square kilometer. Current regulations in Core Areas could limit GRSG losses from energy developments, but they may not promote GRSG recovery.84 * 2015 Holloran Study (importance of caps): Use of suitable winter habitat by sage-grouse decreased with increasing density of gas wells within 2.8 km of data loggers. Habitat use also increased with distance to wells and plowed main haul roads, but well density was a better predictor. Effects of anthropogenic activity were evident at lower well densities. Effects of gas development on sage-grouse can be reduced by minimizing well densities and adopting methods that reduce anthropogenic activities.85 * 2015 Fedy study (importance of caps): Birds avoided areas of high well density and nests were not found in areas with greater than 4 wells per km2 and majority of nests (63%) were in areas with = 1 well per km2.86 * 2015 Kirol study (importance of caps): Energy infrastructure had negative effects on habitat use and brood survival, with brood survival decreasing once surface disturbance exceeded 4 percent. Results suggest that reduction of habitat quality was primarily driven by avoidance of energy infrastructure, resulting in primary and secondary source habitat becoming low-occurrence habitat.87 * 2017 Spence Study (importance of caps): Probability of lek collapse inside core areas was positively related to the density of oil and gas wells located outside of core areas at two distances - within 1.6 km and within 4.8 km of the core area boundary.88 * 2018 Holloran Letter (importance of 2015 protections): Recommending management approaches and objectives established in 2015 BLM sage-grouse land use plans be used as minimum standards in sagebrush habitat.89

As explained in the NTT report: Sage grouse exhibit strong site fidelity (loyalty to a particular area even when the area is no longer of value) to seasonal habitats, which includes breeding, nesting, brood rearing, and wintering areas. (Connelly et al. 2004, Connelly et al. 2011b). Adult sage grouse rarely switch between these habitats once they have been selected, limiting their adaptability to changes. NTT at 51 (emphases added). Accordingly, loss of critical wintering habitat could lead to extirpation of sage-grouse populations that solely rely on these areas for the winter. See also FEIS at 3-5 ("Site fidelity in breeding birds could delay population response to habitat changes, and a clear response may require the death of most site-tenacious individuals.")

Attached is Attachment 3 to comments submitted by The Wilderness Society, Conservation Colorado, National Audubon Society, Colorado Wildlife Federation, Rocky Mountain Wild, Western Values Project, National Wildlife Federation and Natural Resources Defense Council.

For example, in Wyoming, Copeland et al. (2013) projected further sage-grouse population declines with full and rigorous implementation of the Wyoming Core Area plan (which subsequently was implemented in the federal Wyoming amendments and revisions as PHMA). Smith et al. (2017:9) found

much lower probability of lek collapse inside PHMA, attributing this to a lower density of energy development in designated PHMA habitats: "This finding was predictable given how Core Areas were delineated to avoid existing energy disturbance and the low densities of disturbance where Core Areas were to be established prior to the [state Sage-Grouse Executive Order] in 2008." Also for Wyoming, Juliusson et al. (2017) modeled the likelihood of future oil and gas development under state and federal development restrictions (but not incorporating prioritization of leasing and development outside Core Areas, and found that with all other restrictions applied, 27.4% of the sage-grouse population would be exposed to baseline or highintensity energy development in Management Zone I (Northern Plains), versus 13.9% of the sage-grouse population in Management Zone II. Spence et al. (2017) found that the likelihood of lek collapse inside PHMAs was roughly half that of leks outside PHMAs, related to comparatively higher levels of surface development outside PHMAs, but also found that leks 53 near the boundary are likely to be negatively affected by development along the PHMA boundary. Edmunds et al. (2016) documented continued declines in most Core Areas, while Gamo and Beck (2017) attributed value to the Core Area effort on the basis of lower levels of drilling and construction in sage-grouse habitats outside Core Areas versus inside them. Based on these studies, RMPAs as originally drafted and approved are expected to slow the decline, but not to halt or reverse it. During the pendency of the sage-grouse RMPA process and in the years that followed, approximately 5 million acres of oil and gas leases were deferred from federal lease auctions across 7 western states due to sage-grouse concerns, including 2.2 million acres in Nevada, 1.6 million acres in Wyoming, 600,000 acres in Montana, and more than 300,000 acres each in Colorado and Utah. This enormous amount of lease deferral represents the sole effective and scientifically sound conservation measure in the ARMPAs, inasmuch as sage-grouse habitats that remain unleased cannot be industrially developed, and their habitats are not subject to further degradation.

It is a well-established principle that for sage grouse, there is a time-lag for population responses to habitat impacts, taking two to ten years before population changes become measurable (Holloran 2005, Walker et al. 2007, Harju et al. 2010). As a result, the appropriate decision-point for changing management strategies would actually be 2-10 years before population declines are noted (in the best-case scenario that monitoring reliably recognizes a downturn as caused by a management problem versus population cyclicity, which is also problematic), which means that by the time that adaptive management changes are adopted it is already too late, the damage has been done, and because industrial infrastructure is rarely removed once in place the damage has become effectively irreversible.

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Dakota. Crist et al. (2015) provided a critique that indicated that many 68 PHMA units were too small and isolated to sustain sage-grouse populations over the long term, and also noted that a handful of large areas are strongholds of disproportionate importance to sage-grouse conservation efforts. All lands designated as Priority Areas for Conservation ("PACs") by the U.S. Fish and Wildlife Service need to be designated as Priority Habitat Management Areas and given strong, science-based protections in accord with the recommendations of the National Technical Team. In addition, expansions of PHMA are warranted in Wyoming, where the BLM and U.S. Fish and Wildlife Service erroneously incorporated reductions in state Core Area designations that were made for political, rather than scientific, proposes, and which render this state's Priority Habitat Management Areas scientifically invalid.

It is a well-established principle that for sage grouse, there is a time-lag for population responses to habitat impacts, taking two to ten years before population changes become measurable (Holloran 2005, Walker et al. 2007, Harju et al. 2010). As a result, the appropriate decision-point for changing management strategies would actually be 2-10 years before population declines are noted (in the best-case scenario that monitoring reliably recognizes a downturn as caused by a management problem versus population cyclicity, which is also problematic), which means that by the time that adaptive management changes are adopted it is already too late, the damage has been done, and because industrial infrastructure is rarely removed once in place the damage has become effectively irreversible.

Holloran (2005) found that several types of oil and gas infrastructure sited within 1.9 miles of the lek site had a negative impact on populations of breeding males on the lek; these infrastructure feature include both wellpads during the post-drilling, production phase and gravel trunk roads leading to five or more wellpads. It is important to note that a single wellpad or road can cause significant impacts, and these impacts occur even in cases where roads are not visible from the lek site due to intervening terrain (Holloran 2005). Drilling activities can have significant impacts when wells are sited within 3 miles of leks (id.). Manier et al. (2014) 72 reviewed all available science and found that appropriate lek buffers (the "interpreted range") ranged from 3.1 to 5 miles. Aldridge and Boyce (2007) suggested that even larger buffers (10 km) are warranted. In addition to significant negative impacts on breeding populations at the lek site, industrial incursions can also have a significant negative impact on nesting females. The lek is the hub of nesting activity, with most females nesting within 4 to 6 miles of a lek site. Holloran et al. (2007) found that yearling sage grouse avoided otherwise suitable nesting habitat within 930m (almost 0.6 mile) of oil and gas-related infrastructure. This means that individual wellsites, and their access roads and other related facilities, will be surrounded by a 0.6-mile band of habitat that has substantially lost its habitat capability for use by nesting grouse. The National Technical Team (2011: 20) observed, "it should be noted that protecting even 75 to >80% of nesting hens would require a 4-mile radius buffer (Table 1). Even a 4-mile NSO buffer would not be large enough to offset all the impacts reviewed above." Importantly, a 0.6-mile lek buffer covers by area only 2% of the nesting habitat encompassed by a 4-mile lek buffer, which takes in approximately 80% of nesting grouse according to the best available science.

The BLM's own experts recommended for existing fluid mineral leases that a 4-mile No Surface Occupancy buffer should be applied to leks, with an exception allowed in cases where the entire lease is within 4 miles of a lek, in which case a single wellsite should be permitted in the part of the lease most distal to the lek (NTT 2011). This recommendation is reinforced by a similar recommendation from western state agency biologists, who also recommended a 4-mile No Surface Occupancy buffer (Apa et al. 2008). According to Taylor et al (2012: 27), in a study commissioned by BLM, Second, female sage-grouse that visit a lek use an approximately 9-mi (15-km) radius surrounding the lek for nesting; a 2-mi

(3.2-km) radius encompasses only 35-50% of nests associated with the lek (Holloran and Anderson 2005, Tack 2009). While a lek provides an important center of breeding activity, and a conspicuous location at which to count birds, its size is merely an index to the population dynamics in the surrounding habitat. Thus attempting to protect a lek, without protecting the surrounding habitat, provides little protection at all.

To the extent that BLM's existing ARMPAs and revised RMPs ignore the recommendations of its own experts, they are arbitrary and capricious and an abuse of discretion. BLM should rectify this legal deficiency if the ARMPAs are further amended. In the context of the original Greater Sage-Grouse RMP amendment and revision effort, BLM's own Draft EIS analysis has supported 4-mile No Surface Occupancy buffers to be applied as Conditions of Approval to existing fluid mineral leases. The Wyoming Nine-Plan DEIS states, "Walker et al. (2007) recommends a buffer distance of at least 4.0 miles containing extensive stands of sagebrush habitat for breeding populations to persist." Wyoming Greater Sage-grouse RMP Amendment DEIS at 4-291. For the Buffalo RMP revision, BLM's analysis of the science states, 73 "Energy development within two miles of leks is projected to reduce the average probability of lek persistence from 87% to 5% (Walker et al. 2007a). Current research suggests that impacts to leks from energy development are discernible out to a minimum of 4 miles, and that some leks within this radius have been extirpated as a direct result of energy development (Apa et al. 2008). Even with a timing limitation on construction activities, Greater Sage-Grouse avoid nesting in oil and gas fields because of the activities associated with operations and production" Buffalo RMP Revision DEIS at 367. For Montana, BLM observes, "Impacts from energy development occur at distances between 3 and 4 miles. Impacts to leks caused by energy development would be most severe near the lek." HiLine RMP Revision DEIS at 4-135. Manier et al. (2014) undertook a comprehensive analysis of the available science on lek buffers, and concluded that the appropriate range for lek buffer protections was 3.1 to 5 miles, which encompasses and buttresses BLM's earlier NTT (2011) expert recommendations. State agencies and their wildlife experts have long pointed out the flaws in smaller lek buffers and the need for 4-mile No Surface Occupancy buffers around leks. According to the Nevada Division of Wildlife, "…the current NSO distance is 0.6 miles, which is not based on the best available science (see Coates et al. 2013 which suggests a buffer distance of 5.0 kilometers)." NDOW comments on Nevada - Northeastern California DEIS, January 14, 2014, analysis chart 1. Apa et al. (2008, emphasis added) reviews the best available science by a team of state sage grouse biologists, and states, "Yearling female greater sage-grouse avoid nesting in areas within 0.6 miles of wellpads, and brood-rearing females avoid areas within 0.6 miles of producing wells. This suggests a 0.6- mile buffer around all suitable nesting and brood-rearing habitat is required to minimize impacts to females during these seasonal periods." This report further clarifies, "These suggest that all areas within at least 4-miles of a lek should be considered nesting and brood-rearing habitats in the absence of mapping." Thus, by combining these two recommended buffers, state experts in this report in effect recommended a 4.6-mile NSO buffer around active leks. The U.S. Fish and Wildlife Service has also pointed out the inadequacy of smaller lek buffers. For the Utah RMP effort, the agency states, "There is substantial scientific information that shows that impacts of human disturbance (e.g. oil and gas drilling) to sage-grouse remain discernible out to distances > 4 miles of a lek." Attachment 2, USFWS comments on Utah Conservation Plan 7/12/12, at 3. The agency goes on to conclude, "In summary, we recommend avoiding permanent structures within a 4 mile lek buffer…at all times. Exceptions may be appropriate for the placement of permanent structures on non-habitat areas within the 4 mile lek buffer if it can be determined that the location of these structures will not impact nesting sagegrouse." USFWS comments Utah Conservation Plan, 5/8/13 at 8. In Nevada, the USFWS states, "We recommend a year-round lek buffer of 4.0 miles." 74 BLM's own NEPA analysis

indicates that proposed lek buffers are inadequate. In the Nevada - Northeastern California DEIS, BLM states, Impacts on GRSG accrue over varying distances from origin depending on the type of development: ? Energy extraction such as oil and gas, geothermal, and plan of operation mining at 11.8 miles (19 kilometers) based on direct impacts of field development, including associated infrastructure, noise, lighting, and traffic (Johnson et al. 2011; Taylor et al. 2012) Nevada - Northeastern California Greater Sage-grouse RMP Amendment DEIS at 605. BLM Wyoming Draft EIS analysis arrives at the same conclusion: "Buffer distances from 0.5 to two miles from oil and gas infrastructure have been shown to be inadequate to prevent declines of birds from leks (Walker et al. 2007). Studies have shown that greater distances, anywhere from two to four miles, are required for viable Greater Sage-Grouse populations to persist (Connelly et al. 2000, Holloran and Anderson 2005, Walker et al. 2007)." Wyoming Greater Sage-grouse RMP Amendment DEIS at 4-335. According to Apa et al. (2008), "Buffer sizes of 0.25 mi., 0.5 mi., 0.6 mi., and 1.0 mi. result in estimated lek persistence of 5%, 11%, 14%, and 30%." BLM concludes, "Studies have shown that greater distances, anywhere from two to four miles, are required for viable Greater Sage-Grouse populations to persist." Wyoming Greater Sage-grouse RMP Amendment DEIS at 4-335. For these reasons, the application of a 0.6-mile lek buffer is arbitrary and capricious, violates BLM Sensitive Species Policy, and will contribute to further population declines in Core Areas that will contribute to the need to protect the greater sage grouse under the Endangered Species Act. Holloran (2005) undertook an empirical test of the adequacy of 0.25-mile No Surface Occupancy buffers and 2-mile Timing Limitation Stipulations, and determined that sage grouse in the Pinedale Anticline and Jonah Fields would be completely extirpated within 19 years of the study as a result of full-field development with this package of protections applied. BLM's NEPA analysis for a recent Miles City Field Office oil and gas leasing EA provides a thorough synopsis: "Sage grouse are offered species specific protections through a stipulation. Under Alternative B, ¼ mile NSO buffers and 2 mile timing buffers would apply where relevant. Based on research, these stipulations for sage grouse are considered ineffective to ensure that sage grouse can persist within fully developed areas. With regard to existing restrictive stipulations applied by the BLM, (Walker et al. 2007a) research has demonstrated that the 0.4-km (0.25 miles) NSO lease stipulation is insufficient to conserve breeding sage-grouse populations in fully developed gas fields because this 75 buffer distance leaves 98 percent of the landscape within 3.2 km (2 miles) open to fullscale development. Full-field development of 98 percent of the landscape within 3.2 km (2 miles) of leks in a typical landscape in the Powder River Basin reduced the average probability of lek persistence from 87 percent to 5 percent (Walker et al. 2007a). Other studies also have assessed the efficacy of existing BLM stipulations for sage grouse. Impacts to leks from energy development are most severe near the lek, and remained discernable out to distances more than 6 km (3.6 miles) (Holloran 2005, Walker et al. 2007a), and have resulted in the extirpation of leks within gas fields (Holloran 2005, Walker et al. 2007a). Holloran (2005) shows that lek counts decreased with distance to the nearest active drilling rig, producing well, or main haul road, and that development influence counts of displaying males to a distance of between 4.7 and 6.2 km (2.9 and 3.9 miles). All well-supported models in Walker et al. (2007a) indicate a strong effect of energy development, estimated as proportion of development within either 0.8 km (0.5 miles) or 3.2 km (2 miles), on lek persistence. Buffer sizes of 0.25 mi., 0.5 mi., 0.6 mi. and 1.0 mi. result in an estimated lek persistence of 5 percent, 11 percent, 14 percent, and 30 percent. Lek persistence in the absence of CBNG development averages approximately 85 percent. Models with development at 6.4 km (4 miles) had considerably less support, but the regression coefficient indicated that impacts were still apparent out to 6.4 km (4 miles) (Walker et al. 2007a). Tack (2009) found impacts of energy development on lek abundances (numbers of males per lek) out to 7.6 miles." Miles City October 2014 Oil and Gas Leasing EA, Environmental Assessment DOIBLM-MT-C020-2014-0091-EA, May 19, 2014 at 60. For most states,

BLM purported to apply lek buffer distances in accordance with Manier et al. (2014) at the project stage of the NEPA approval process. These typically are set at 3.1 miles for roads and energy infrastructure, 2 miles for tall structures, and 1.2 miles for low structures, and represent the lowest (least protective) end of the protection spectrum described by Manier et al. (2014). Green et al. (2017) found that oil and gas development in proximity to leks contributed to a 2.5% per year decline in sage-grouse populations, and that the 3.1-mile buffer best explained these energy-driven declines, but it is important to note that these researchers neglected to test development densities at buffer distances larger than 3.1 miles in radius. We are concerned that these buffer distances (and also the 1.2-mile standard for low structures) are inappropriately small (with the possible exception of the road buffer) because while they be adequate to protect breeding grouse while on the lek based on the best available science, they will allow these disruptive and damaging features to be located in the midst of prime nesting habitat, which extends 5.3 miles from the lek site (Holloran and Anderson 2005). Furthermore, "Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts." See, e.g., Idaho/Southwest Montana RMPA FEIS at DD-1. Statements like these completely undermine the certainty of implementation of lek buffers, rendering them completely discretionary. Because the nesting period is equally sensitive and equally important to survival of and recruitment to

A limit of 3% human surface disturbance per square-mile section is the minimum necessary standard for preventing habitat abandonment by sage grouse. Knick et al. (2013) found that 99% of active leks across the western half of the sage grouse's range were surrounded by lands with 3% or less human development. Decker et al. (2017) found a similar result in Colorado, with a linear decrease in sage grouse lek populations once surface disturbance increased above the 2.5% threshold. Preliminary results from Kirol et al. (in prep.) indicate that the vast majority of sage-grouse were found in habitats with <1% surface disturbance. Disturbance density can also affect survival; Kirol et al. (2015a) found that brood survival for sage-grouse began to decline significantly once disturbance density hit the 4% threshold. The vast majority was surrounded by much less disturbance. Copeland et al. (2013) found that if all of the State of Wyoming sage grouse policy provisions (which include a 5% disturbance cap calculated using a Disturbance Density Calculation Tool) were implemented fully and to the letter, that a 9 to 15% decline in greater sage grouse populations would still occur statewide, including a 6 to 9% decline within designated Core Areas (where the 5% disturbance cap would be applied). There is no scientific evidence at all indicating that sage grouse can tolerate a greater percentage of surface disturbance. In particular, the 5% cap on disturbance proposed for the Wyoming RMP amendment for Core Areas and Connectivity Areas been shown to be effective by no scientific study, ever.

Scientific research has determined that one energy site per square mile is the density threshold at which significant impacts to sage-grouse populations begin to be measured (Copeland et al. 2013). Tack (2009) found that this study in Montana's Milk River Basin, well densities of one per square mile also we correlated with a very low probability of a lek being large (see Figure 9, p. 43). The analysis of Copeland et al. (2013) found that a statewide analysis of well densities revealed population decline curves very close to the earlier studies by Holloran (2005), but also noted that a 1 wellpad per square mile density of development correlated to approximately 18% decline in sage grouse lek population (see Figure 4). So one wellpad per square mile definitely is not a zero-impact threshold. Indeed, Garman (2018) found that clustering 8 wells per pad using directional drilling in the Atlantic Rim coalbed methane project, which would meet the one-pad-per-square-mile threshold required for PHMA, still left comparatively little

habitat within the Project Area outside the ecological zone of influence of roads and wellpads. The one-site-per-square- mile-section is a threshold that should not be subject to waiver, modification, or exception.

BLM should not reduce protections for greater sage-grouse on GHMA in Idaho because the agency does not have enough information about some Idaho sage-grouse populations to reasonably predict what impacts of reducing protections will be. One area of concern is the East-Central Idaho population of sage-grouse, where BLM Idaho has proposed oil and gas leasing twice in 2018 and then temporarily deferred leasing after conservation groups filed administrative protests and litigated. In 2012, the U.S. Fish and Wildlife Service convened a "Conservation Objectives Team" of Service and state representatives with expertise in greater sage-grouse science and conservation. In 2013, that body issued a Conservation Objectives Team Report (COT Report) evaluating the threats to the species and recommending conservation measures. The COT Report described the East- Central Idaho sage-grouse population as "isolated/small size" and "high risk" with a "low probability of persistence" COT Report at 22, 76-77. Such a greater sage-grouse population is nevertheless 10 Green, Adam et al., Investigating Impacts of Oil and Gas Development on Greater Sage-Grouse, Journal of Wildlife Management, doi: 10.1002/jwmg.21179 (2016). 85 valuable because it helps ensure the species continues to exist by contributing to its redundancy, representation, and resilience. See COT Report at 12. Preserving peripheral populations is essential to arresting the decline of greater sage-grouse toward extinction and Endangered Species Act listing. See COT Report at 12-13. The COT Report further stated: [L]ittle information is available on [East Central Idaho] sage-grouse populations other than some limited location and attendance data on a few leks. No lek routes have been established within this area that would allow consistent monitoring of sage-grouse populations. This lack of data is largely due to very difficult access in most years during winter and spring. COT Report at 76. This paucity of information about the East-Central Idaho/East Idaho Uplands population of sage-grouse is well known to resource managers. Due to insufficient population information, the Idaho Department of Fish and Game closed the East Idaho Uplands area of the state to greater sage-grouse hunting in 2008. It has not been reopened since. See 2015 Idaho Sage-grouse Statewide Report at 16, 2016 Sage-grouse Rules at 2 and 2017 Sage-grouse Rules at 2.11 The Sage-grouse Conservation Plan prepared by the East Idaho Uplands Sage-grouse Working Group noted, "There is a need for better information related to population status and trends. Status, survival and trend data relative to sage-grouse populations in the East Idaho Uplands SGPA [Sage-grouse Planning Area] is lacking." EIU Sage-grouse Conservation Plan at 29. The Conservation Plan also stated that much of the area had not been surveyed for sage-grouse or had been only minimally surveyed by air without follow-up ground surveys; due to the lack of consistent lek counts and lek count routes, there was no index to sage-grouse breeding trend. EIU Sage-grouse Conservation Plan at 29. Furthermore, "It is unknown if sage-grouse in the East Idaho Uplands are migratory and if there is one population or multiple populations occurring in different parts of the area." EIU Sage-grouse Conservation Plan at 30. Moreover, the Plan stated there is no information available about seasonal habitat quality, the population is believed to be isolated from other sage-grouse populations, and there may be sage-grouse population isolations within the East Idaho Uplands Planning Area. EIU Sage-grouse Conservation Plan at 30, 31. The 2015 Idaho Sage-grouse Local Working Groups Statewide Annual Report, which was published in August 2016 by the Idaho Sage-grouse Advisory Committee Technical Assistance Team, demonstrates that five years later, these data deficiencies still existed. "Lack of information" was listed as a threat to the East Idaho Uplands greater sage-grouse population: "Most of EIU [East Idaho Uplands] does not have detailed information on populations, movements, etc." 2015 Idaho Sage-grouse Statewide Report at 20.12 11 The 2018-2019 Idaho sage-

grouse season will not be set until August 2018. See Idaho Department of Game and Fish, Upland Game, Turkey & Furbearer, 2018 & 2019 Seasons & Rules at 9. Available at https://idfg.idaho.gov/sites/default/files/seasons-rules-upland-birds-2018-2019.pdf. 12 The 2015 statewide report (published in August 2016) is the most recent. No Idaho Sage-grouse Local Working Group Statewide Report has been published for 2016 or 2017. Email communications between Ann Moser (Idaho Department of Fish and Game) and Kelly Fuller (Western Watersheds Project), December 19, 2017. 86 Oil and gas leasing and exploratory well drilling in this area, near Grays Lake National Wildlife Refuge, has occurred in the past, despite BLM's lack of site-specific greater sagegrouse population information for this area. Attachment 6. Although BLM has deferred oil and gas leasing in this area twice in 2018, the Expressions of Interest that led to this area being scheduled for leasing are still listed as "pending" in BLM's National Fluids Lease Sale System database as of July 17, 2018.

Its impact analysis must also account for the primacy of cheatgrass invasion in determining patterns of rangeland fire. According to BLM's past NEPA analysis, "The positive feedback loop between fire and invasive plant species may be the greatest impact on fire management and GRSG (Abatzoglou and Kolden 2011)." Nevada - Northeastern California Greater Sage Grouse RMP Amendment DEIS at 701. BLM further elucidates, 87 In Oregon 19th and early 20th century grazing practices, along with introduction and spread of invasive plant species and the practice of fire suppression in the 20th century, have all contributed to fire suppression and to increasingly destructive wildfires. Oregon Greater Sage Grouse RMP Amendment DEIS at 4-10. BLM's past NEPA analysis concedes, "In the absence of cheatgrass, Wyoming big sagebrush sites can take 150 years to recover." Nevada - Northeast California Greater Sage Grouse RMP Amendment DEIS at 608. When cheatgrass is present, it can take over following disturbance, forming a monoculture characterized by unnaturally frequent fire return intervals that can effectively prevent the recovery of sagebrush and perennial grasses on a long-term if not permanent basis. For Oregon, BLM states, "In Wyoming big sagebrush sites, full recovery to pre-burn sagebrush canopy cover conditions will take over 100 years (Cooper 2007);…." Oregon Greater Sage Grouse RMP Amendment DEIS at 3-70. More generally, BLM states, "Sagebrush recovers slowly from fire; most species do not resprout but must be replenished by winddispersed seed from adjacent unburned stands or seeds in the soil. Depending on the species and the size of a burn, sagebrush can reestablish itself within five years, but a return to a full pre-burn community cover can take 50 to over 100 years (Baker 2011)." Oregon Greater Sage Grouse RMP Amendment DEIS at 4-10. For these reasons, BLM must incorporate science-based measures to reduce the spread of cheatgrass, including rest from livestock grazing, into any future sage-grouse plan amendments, and must also rest burned areas for two years or more from livestock grazing, to allow native perennial grasses to recover and to reduce the distribution of weed seeds on newly burned areas.

Smith et al. (2017:9) found much lower probability of lek collapse inside PHMA, attributing this to a lower density of energy development in designated PHMA habitats: "This finding was predictable given how Core Areas were delineated to avoid existing energy disturbance and the low densities of disturbance where Core Areas were to be established prior to the [state Sage-Grouse Executive Order] in 2008." Also for Wyoming, Juliusson et al. (2017) modeled the likelihood of future oil and gas development under state and federal development restrictions (but not incorporating prioritization of leasing and development outside Core Areas, and found that with all other restrictions applied, 27.4% of the sage-grouse population would be exposed to baseline or highintensity energy development in Management Zone I (Northern Plains), versus 13.9% of the sage-grouse population in Management Zone II. Spence et al. (2017) found that the likelihood of lek collapse inside PHMAs was roughly half that of

leks outside PHMAs, related to comparatively higher levels of surface development outside PHMAs, but also found that leks near the boundary are likely to be negatively affected by development along the PHMA boundary. Edmunds et al. (2016) documented continued declines in most Core Areas, while Gamo and Beck (2017) attributed value to the Core Area effort on the basis of lower levels of drilling and construction in sage-grouse habitats outside Core Areas versus inside them. Based on these studies, RMPAs as originally drafted and approved are expected to slow the decline, but not to halt or reverse it. During the pendency of the sage-grouse RMPA process and in the years that followed, approximately 5 million acres of oil and gas leases were deferred from federal lease auctions across 7 western states due to sage-grouse concerns, including 2.2 million acres in Nevada, 1.6 million acres in Wyoming, 600,000 acres in Montana, and more than 300,000 acres each in Colorado and Utah. This enormous amount of lease deferral represents the sole effective and scientifically-sound conservation measure in the ARMPAs, inasmuch as sage-grouse habitats that remain unleased cannot be industrially developed, and their habitats are not subject to further degradation.

Wyoming Greater Sage-grouse RMP Amendments Draft EIS at 4-276. Wisdom et al. (2011) found that lands within 3.1 miles of transmission lines and highways had an elevated rate of lek abandonment. Nonne et al. (2011) found that raven abundance increased along the Falcon-Gondor powerline corridor in Nevada both during the construction period, and long-term after powerline construction activities had ceased. Braun et al. (2002) reported that 40 leks with a power line within 0.25 mile of the lek site had significantly slower population growth rates than unaffected leks, which was attributed to increased raptor predation. Dinkins (2013) documented sage grouse avoidance of powerlines not just during the nesting period but also during early and late brood-rearing. LeBeau et al. (2014) found that sage grouse avoided habitats within 2.9 miles of transmission lines during the brood-rearing period. Hansen et al. (2016) documented negligible additional avoidance of a powerline co-located with an existing transmission line in low-quality wintering habitats in Utah, and stated (at p. 184, "existing transmission line corridors located in poor-quality winter habitat are likely already avoided by sage-grouse, and co-locating additional lines within these corridors may dampen the effects of new tall structures on the landscape in the years immediately following construction." Dinkins et al. (2014) documented no spatial avoidance, but lower hen survival in areas with higher powerline density. Shirk et al. (2015) found that colocating several transmission lines beside each other resulted in a complete barrier to sagegrouse migration and dispersal in central Washington. The National Technical Team (NTT 2011) recommended that Priority Habitats be exclusion areas for overhead powerlines, and that General Habitats should be avoidance areas for overheads lines. And according to BLM's own NEPA analysis, Impacts on GRSG accrue over varying distances from origin depending on the type of development: ? Tall structures such as power lines, wind turbines, communication towers, agricultural, and urban development based on an avian predator foraging distance of 4.3 miles (6.9 kilometers; Boarman and Heinrich 1999; Leu et al. 2008) Nevada - Northeastern California Greater Sage-grouse RMP Amendment DEIS at 605. The National Technical Team (NTT 2011) recommended that Priority Habitats be exclusion areas for overhead powerlines, and that General Habitats should be avoidance areas for overheads lines. And according to BLM's own NEPA analysis, 61 Impacts on GRSG accrue over varying distances from origin depending on the type of development: ? Tall structures such as power lines, wind turbines, communication towers, agricultural, and urban development based on an avian predator foraging distance of 4.3 miles (6.9 kilometers; Boarman and Heinrich 1999; Leu et al. 2008) Nevada - Northeastern California Greater Sage-grouse RMP Amendment DEIS at 605. The National Technical Team (2011) recommended that general habitats be managed as avoidance areas for new rights-of-way,

and also recommended that overhead powerlines and other infrastructure that have fallen out of use should be removed, when they occur in Priority Habitats

We also recommend that the 2018 FEIS incorporate by reference the October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment that the U.S. Geological Survey ("USGS") prepared for BLM. Incorporating the October 2016 USGS Mineral Potential Report would cure the deficiencies in the 2015 FEIS, which did not include Affected Environment or Environmental Consequences for Geology and Minerals. It is not currently included in the references section in the 2018 DEIS or specifically incorporated by reference and needs to be added. The 2016 SFA Withdrawal DEIS presents overwhelming documentation of the miniscule impact that mineral activities within the SFAs would create over the next 20 years and the enormous economic harm that the proposed withdrawal would cause in Nevada that justifies BLM' s selection of the Preferred Alternative in the 2018 DEIS to jettison the SFA withdrawals. As documented in the 2016 SFA Withdrawal DEIS, the footprint of mining and mineral exploration activities in the SFAs as designated in the 2015 LUPs was projected to amount to a mere 2,620 acres across the six SFA states. BLM quantifies these impacts as affecting only about 0.026 percent of the 10 million-acre SFAs. (2016 SFA Withdrawal DEIS at 4-75). The 2016 SFA Withdrawal DEIS also includes important information about the scope of mining impacts under a No Action Alternative (i.e., without the SFA withdrawals), which is now BLM's Preferred Action in the 2018 DEIS: . . .the total amount of mining related disturbance in sagebrush habitat under the No Action Alternative would be 9,554 acres, or approximately one-tenth of 1 percent of the total withdrawal area... These disturbances could impact vegetation communities on 0.1 percent of the SFAs with the majority of the impacts estimated to occur in Nevada and Idaho." (SFA Withdrawal DEIS at 4-71 and 4-72, bold emphasis added.) 1 https://pubs.usgs.gov/sir/2016/5089/b/sir20165089b.pdf 2 The 2016 SFA Withdrawal DEIS documents that the proposed 20-year withdrawal would cause a staggering aggregate adverse impact of $14 billion in reduced economic output, $2.4 billion in less labor compensation, and 34,000 fewer jobs in five of the six SFA states, with Nevada, Idaho, and Wyoming bearing the brunt of these impacts. The 2,620 acres is comprised of 187 acres in Idaho, 81 acres in Montana, 2,285 acres in Nevada, 66 acres in Oregon, 1 acre in Wyoming, and 0 acres in Utah. (SFA Withdrawal DEIS at 2-10). The 2016 SFA Withdrawal DEIS clearly documents that mineral activities do not adversely impact GSG or its habitat and that the proposed withdrawal was unwarranted. In light of this information, BLM is completely correct and justified in excluding the SFA mineral withdrawal from its Preferred Alternative in the 2018 DEIS and must reject the No Action Alternative considered in the 2018 DEIS which would preserve the SFA withdrawals.

BLM acknowledges that ". . .landscape level mapping may not accurately reflect on-the-ground conditions." (DEIS at 2-6) and states "[ ] Need for adjusting habitat management areas (HMAs) so that they reflect the best available science" (DEIS at ES-3). PGC is concerned that the Allocation Exception Process is too narrow and rigid to give BLM the necessary flexibility to use best available science (e.g., field-verified habitat data) and to make project-specific decisions in GSG habitat based on actual, field-verified habitat data. The allocation exception process needs to state clearly that one of the circumstances which always requires an allocation exception is when a project applicant provides on-the-ground habitat data collected by a qualified biologist using BLM-approved data collection protocols that documents different habitat conditions than on Figure 1-2b. BLM should be required to base project decisions on actual field-verified habitat conditions rather than on the habitat management classifications shown on Figure 2-1b. Therefore, whenever BLM has field-verified habitat data that have been provided by a project proponent, the State of Nevada, or otherwise obtained by BLM, BLM must use this

information in making land use decisions. In these circumstances, the landscape management area classification map (e.g., Figure 2-1b) cannot be used as the basis for BLM's decision. The restrictions that apply to the PI-IMA management classification must not be required on lands that are GHMA, OHMA, or non-habitat based on field-verified habitat conditions. Similarly, the restrictions that apply to GHMA must not be required on lands that are OHMA or non-habitat based on field-verified habitat conditions. Because BLM is compelled to use best available science, granting an allocation exception should be the standard operating procedure that does not require the State Director's authorization. BLM District Managers should be authorized to grant allocation exceptions whenever BLM is provided with field-verified habitat data that conflicts with Figure 2-1 b. As stated elsewhere, the land use restrictions in the amended 2018 GSG LUP cannot substantially interfere with a claimant's rights under the U.S. Mining Law including the rights of ingress and egress, and reasonable use and occupancy for mineral exploration and development purposes. The following discussion of the Allocation Exception Process as presented in Table 2-2 is poorly worded and confusing: "Verify use of landscape-scale mapping of PHMA, GHMA, and OHMA in regards to the application of allocations and stipulations." (DEIS at ES-3 and 2-12). As written, this appears to contradict the DEIS provisions pertaining to modifying habitat management area designations based on field-verified habitat data and diminish or even eliminate the need for an exception process. To make the allocation exception process consistent with the procedures outline to modify habitat management area designations PGC suggests this sentence needs to be re-written to say: "Use field-verified habitat data whenever available to make project-specific decisions and to apply allocation exceptions and stipulations." Similarly, the sentence on Table 2-2 stating "In PI-IMA and GHMA, the State Director may grant an exception to the allocations and stipulations described in Section 2-5 if one of the following applies... " is circular and confusing because Table 2-2 is the only content in Section 2.5.

It should be noted that Sage-grouse have not been observed or documented in the Stillwater Mountains for decades as documented in the 2001 Nevada Sage-grouse Conservation Plan, which notes there are no active leks or population estimates for the Stillwater Population Management Unit.

We recommend that DOI explicitly state in the RODs for the LUPAs in clear terms that since issuance of the Reports, science and information about GRSG has evolved, and shortcomings with the Reports have become evident. DOI should expressly state that management prescriptions from the 7 Reports should be viewed with caution and modified based upon the best available information, including state and local science and knowledge.

Appendix A: Maps, Figures 2-2a and 2-2b Figures 2-2a and 2-2b depict Biologically Significant Units and Lek Clusters designated in the No Action Alternative and Management Alignment Alternative respectively. It is not clear how designating these groups as "biologically significant" is appropriate. Coates el al. 2017, the publication upon which the Management Alignment map is based, appears to delineate these areas based mainly on climatic areas. However, the term Biologically Significant Unit implies emigration, immigration and most importantly gene flow within the area. Tribal Sage-grouse studies have produced data that conclude it would be highly unlikely that these important biological processes would take place across such large land areas. For example, the Management Alignment Alternative combines the Lassen/South Washoe, Likely Tables PMU, Northwest Great Basin, Pueblo Range, Black Range, and Western Pershing units from the No Action Alternative units into one Biologically Significant Unit titled Carson City. Given the distance and terrain in between these units, it is highly unlikely that enough emigration, immigration, or gene flow is occurring between the populations in Western Pershing and populations in Likely Tables PMU to call them communally a biologically

significant unit. The Tribe is concerned that lumping these units together into fewer and larger conglomerations will result in the loss of understanding of the extremely important smaller population units. For instance, if the a truly biologically significant unit (as designated in the No Action Alternative) experiences a population decline, when grouped into a larger unit, the significance of such decline would likely be minimized and overlooked.

* Continue to Improve sage-grouse data: Our understanding is that there is little hard evidence for bird counts and that there is little up-to-date data on leks. Much of the data supplied in the previous EIS is decades old and does not take into consideration recent changes to the environment. In particular, fires and recent human developments have impacted some lek sites, but these sites remain in the model used for designation and regulation of sage-grouse habitat. The data need to be brought current before management recommendations can be made appropriately.

Please correct your text to fully accept the series of reports authored by Nevada Assemblyman Ira Hansen and the web site of Nevada Naturalist and Rancher Cliff Gardner http://www.gardnerfiles.com/

We have found that agency officials, including state agency employees, have proclaimed, with no technical support, that sage grouse were abundant prior to settlement by Americans and have declined since about 1860. That unsupported assumption is false, pervasive, and must be removed from reference in accordance with federal standards for objective and factual information.

History shows that there was a dramatic increase in sage grouse numbers and distribution from 1860 to historic high numbers in about 1960. History then shows there has been a sage grouse decline from historic high numbers in the Twentieth Century. This decline in sage grouse numbers (and other wildlife) parallels the federal agency decimation of ranches and livestock numbers. Factual information from Hansen, Gardner, and others has been provided to BLM, USFWS, USFS, and Nevada Sagebrush Ecosystem Council repeatedly and is ignored or worse is rejected in favor of purely speculative statements about sage grouse numbers and habitat. Please include in the DRMP/EIS the fact that the historic numbers of sage grouse peaked about 1960 not prior to 1860 and base your analysis on that factual data that indicates it has been federal regulatory decisions that coincide with sage grouse decline over the last 40 years.

DRMP/EIS must carefully characterize habitats that are actually required by sage grouse in order for the birds to thrive and be abundant. As a starting point, where populations of the birds are healthy should be the locations where detailed descriptions of the occupied habitat are completed. LUPA]FEIS carelessly failed to identify sagebrush species in accordance with standard Botanical taxonomy and failed to adhere to standards of objectively providing the technical details of sagebrush dominated plant communities and other attributes of sage grouse habitat. DRMP/EIS should refer to NRCS Ecological Site concepts and then actually use the technical basis provided by Cooperative Soil Survey, Ecological Site Description, and evaluation of plant communities in terms of Seral Status and State or Transition. DRMP/EIS should avoid or discard landscape descriptions that lack technical substantiation such as the TNC and WAFWA Management Zone depictions apparently based on GAP and RE-GAP.

EPA recommends that the Final EIS either specify the objectives in question or include a citation to their source document.

Issue #1: Viability of GRSG. The Department (FWS and BLM) previously manipulated the status of GRSG, suggesting therefrom a false view that something more is needed relating to permitted livestock grazing upon the public lands in the Western United States, beyond what is already in place. E.g. 43 C.F.R. Part 4100, subpart 4180. This manipulation must stop and the Department must provide a sound statement as to the status of GRSG. A. Historic Population Trends for Greater Sage-Grouse. The FWS Findings admit that GRSG "numbers are difficult to estimate due to the large range of the species, physical difficulty in accessing some areas of habitat, the cryptic coloration and behavior of hens (Garton et al. in press, p. 6), and survey protocols." See 75 Federal Register 13921 (3/23/2010) ("FWS Findings"). The FWS Findings ultimately conclude "since neither presettlement nor current numbers of sagegrouse are accurately known, the actual rate and magnitude of decline since presettlement times is uncertain." See FWS Findings, page 13923. Despite the recognition that the rate and magnitude of change in GRSG populations over time is uncertain, the FWS Findings assume that GRSG populations have significantly declined from pre-settlement populations based primarily upon conclusions from several sources indicating that "sage-grouse population numbers in the late 1960s and early 1970s were likely two to three times greater than current numbers". See FWS Findings, page 13922. [Note that the cited high populations in the late 1960s and early 1970s tell us nothing about pre-settlement numbers.] The FWS Findings report that "three groups of researchers using different statistical methods (but the same lek count data) concluded that rangewide greater sage-grouse have experienced long-term population declines in the past 43 years, with that decline lessening in the past 22 years." See FWS Findings, page 13923. However, looking back 43 years, or even 80 years, tells us nothing about pre-settlement GSG numbers. The FWS Findings ultimately conclude "(a)lthough the declining population trends have moderated over the past several years, low population sizes and relative lack of any sign of recovery across numerous populations is troubling." See FWS Findings, page 13987. But this conclusion is based primarily upon the observed GRSG population declines from the high numbers in the 1960s to today, which cannot be used to establish how current GRSG populations compare to pre-settlement populations. Yet, based primarily upon estimated populations at these two points in history, the FWS Findings assume a relatively linear trend line for sage-grouse populations, and thus falsely presume that pre-settlement GRSG populations were abundant. B. Current Greater Sage-Grouse Population: 350,000 to 535,000 RangeWide. Notwithstanding what may be the pre-settlement populations, the FWS Findings estimate that the current GSG population range-wide totals approximately 535,000 birds. Table 4 of the FWS Findings reports GRSG population estimates by state / region based upon data from state wildlife agencies collected between 2002 and 2008. The estimates for all of the state / region populations combined total 535,542 GRSG. See FWS Findings, Table 4, page 13921. Based thereon, it must be stated that the total estimated current GRSG population of approximately 535,000 birds is 107 times greater than the minimum effective population of 5,000 birds needed to maintain sufficient genetic material to protect the species from the long-term risk of extinction. See FWS Findings, page 13959, wherein the FWS Findings comment, citing Traill et al. (2010, p. 32), that "a minimum effective population size must be 5,000 individuals to maintain evolutionary minimal viable populations of wildlife (retention of sufficient genetic material to avoid effect of inbreeding depression or deleterious mutations)." The estimated populations for Idaho, Montana, and Wyoming in Table 4 of the FWS Findings were based upon hunting harvest data, assuming that 5% of the population is harvested. Elsewhere, the text in the FWS Findings assume that 10% of the population is harvested by hunting (page 13921), which would halve the estimated populations reported in Table 4 (also page 13921) for Idaho, Montana, and Wyoming, resulting in a total estimated current GSG population of over 350,000 birds (351,252, see Table 1 on page 18 herein). This is still 70 times greater than the minimum effective population. Based upon a current estimated population for GSG of 350,000 to 535,000 birds, 70 to 107 times greater than the

minimum effective population of 5,000 birds, it is clear that a viability population of GRSG current exist. However, instead of capitalizing on this fact, the FWS Findings fret that the species may warrant listing because presumed trends of declining populations, if continued, may threaten the species with extinction sometime in the future. However, given the estimated contemporary (1985 to 2007) rate of decline of 1.4% per year (page 13922), it would take 300 to 330 years for the estimated current GSG population to dwindle to the minimum effective population of 5,000 birds. Speculating what might occur three centuries from now stretches far beyond the foreseeable future. Issue #1, Recommendation 1: LUPA as related to GRSG are not warranted based on existing population data. GRSG should be managed at a state level by state agencies just as all other game species. FWS must take a hard look at facts and data when considering species for listing. If, however, the Department of the Interior ("DOI") erroneously decides against this recommendation, we have provided further issues and comments below. Issue 1, DEIS comment 1: This recommendation remains valid. Since DOI ignored this recommendation in the DEIS (see DEIS at Table ES-2), the Issue, the Comment, and the Recommendation remain the same and remain valid.

There seems to be a discrepancy between "DEIS: Table 1-1 Land Management in the Planning Area" (p. 1-3) and "DEIS: Figure 1-1 Planning Area" (map p. 1-4) Table shows acreages that total 70,274,300 acres, which is the size of the state of Nevada. However, the map shows the actual Planning Area to exclude all of Clark, portions of Lincoln and Nye and perhaps a bit of Esmeralda counties. How is it that part of the state is as big as the whole state? Also, Table shows Department of Energy as managing 2,600 acres, but BLM shapefile of 3/10/2016 shows DoE lands totaling 879,758 for the state. If 877,000+ acres are left off the DoE acreage, then how does the total equal that of the state? It also looks like the acreage assigned to "Private" is overly large.

the SEP requests clear information to be articulated within this DEIS regarding the criteria used to determine UUD. Who will determine UUD? When will this process occur? How does this process relate to the multiple use mandate according to the Federal Land Policy and Management Act?

1 1-7 Bullet 2 BLM must ensure that any clarifications are founded in previously completed analyses. If adequate analysis cannot be cited to support the clarification, then BLM must complete that analysis in this EIS.

Chapter 3 3 3-1 20-21 BLM cannot state that wild horse "data and information in the 2015 Final EIS" has not substantially changed. Wild horse herds in NV grow at 15-20% per year and have since 2015. Real time data is readily available from the BLM itself.

3 3-1 3.1.1 Because NCA want to have Table 2-2 apply related to ESD, associated State and Transition Models, Disturbance Response Groups and current ecological state of the cite, it should also incorporate pertinent science specific to the proper application and implementation of such information and tools. This includes, but is not limited to the following studies: BOLTZ, S., AND G. PEACOCK. 2002. Ecological sites: understanding the landscape. Rangelands 24:18-21. BRISKE, D.D., B.T. BESTELMEYER, T.K. STRINGHAM, AND P.L. SHAVER. 2008. Recommendations for development of resilience based state-and-transition models. Rangeland Ecology & Management 61:359-367. SOIL SURVEY DIVISION STAFF. 1993. Soil survey manual. Soil Conservation Service US Department of Agriculture Handbook 18. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, C. COOMBS, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models, Major Land Resource Area 28A and 28B Nevada. University of Nevada

Reno, Nevada Agricultural Experiment Station Research Report 2015-01. p. 1524. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models by disturbance response groups, Major Land Resource Area 25 Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-02:572. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, D. SNYDER, S. PETERSON AND K. SNYDER. 2016. Disturbance Response Grouping of Ecological Sites Increases Utility of Ecological Sites and State-and-Transition Models for Landscape Planning in the Great Basin. Rangelands 38(6):371-378.

3 3-2 Bullet 2 Based on recent science, NCA has concern with the following statement, "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late brood-rearing across all sites". NCA recommends replacing with "selection and positive survival relationships with vegetation (grass and shrub) cover during nesting and late brood-rearing across landscapes still exist. Evidence for a ubiquitous positive relation between grass height and nest success was either greatly diminished (Gibson and others, 2016a) or not supported (Smith and others, 2017b), although some studies that corrected for phenology still support this relation (Smith and others, 2017b; Coates and others, 2017a). Indicator values for grass height need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors and are geographically appropriate." The second bullet mischaracterizes Gibson et al (2016) and links Gibson to the conclusion that "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late broodrearing across all sites." Yet, the USGS points out many studies that do not necessarily make this conclusion. USGS explicitly states that "Indicator values for grass height contained in the habitat objectives tables of the 2015 BLM land use plans…may need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors (Gibson and others, 2016a) and that science findings are geographically appropriate." Examples referenced and discussed by USGS include Gipson et al. (2016) and Smith et al. (2017). Gibson et al. (2016), concluded that "the correlation between grass height and nest success could instead be due to a built-in bias in timing of when vegetation is measured around hatched and failed nests. If habitat measurements are made immediately after researchers determine fate of a nest (either failure or hatch), measurements may be taken weeks later at successful nests than at failed nests, which allows grasses more time to grow. Because the nesting season occurs in the spring during green-up - when grasses can grow more than a half an inch a week - it appears that hatched nests are surrounded by taller grass. Dr. Gibson's study suggested this timing bias is the reason that so many studies have concluded that tall grass is important for concealing nests from predators" (as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height Measurements, Science to Solutions Series Number 15, at 4 (2017)). Smith et al. (2017) "re-analyzed data from three independent studies that previously showed a correlation between grass height and nest success. Smith and his team reevaluated data from studies in the Powder River Basin of southeast Montana and northeast Wyoming (Doherty study), Smith's own research in central Montana, and a site in northeast Utah. When combined with Gibson's research in Nevada, the studies encompassed 1,204 sage grouse nests over 24 study site-years from across the range of sage grouse. In Gibson's study, measurements of vegetation were made at the expected hatch date for all nests, regardless of their actual outcome. This minimized any difference between failed and hatched nests in when vegetation was measured. Gibson then used a linear regression to predict vegetation height at the date of nest fate, simulating the biased methods

common in other sage grouse nesting studies. For his study, Smith used the data that was collected at nest fate - the biased way - and applied the reverse correction to obtain grass heights as though they had been sampled using unbiased methods. Smith found that, when uncorrected, all of the datasets revealed a strong correlation between grass height and nest success. However, following the simple correction to account for bias, there was no longer any association between grass height and nest success in two of the three studies, while the association was slightly reduced in strength but still apparent in the third Powder River Basin. At hatch date, median grass heights at hatched and failed nests were within just 0.05 inches of one another across all re-analyzed datasets. Overall, the research strongly affirmed Gibson's initial findings and suggests that the height of grass is not nearly as crucial to sage grouse nesting success as previously thought" (also as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height Measurements, Science to Solutions Series Number 15, at 4 (2017))

Appendix D Appendix D D-4 D.5.2 Habitat Soft and Hard Triggers (Signals) What is the best available science that indicates these percent change values are valid habitat triggers? Rationale supported by citations must be added to this section to validate this approach.

Appendix D D-5 D.6 Step 2 Determine the Causal Factor It is unclear what is being said under a. and b. presently. It would seem that a key component of the Casual Factor Analysis would be defining the appropriate geographical area. Triggers are programed at the Lek, Lek Cluster and BSU levels, which can be significantly different in size and characteristic. As such, perhaps the best way to couch the "casual factor analysis area" is that the appropriate analysis area (including all pertinent seasonal habitat types) will be determined by the stakeholder group.

Recent studies confirm that oil and gas development can harm both sage-grouse habitat and lifecycle activities, such as breeding.10 Consequently, it is vital that protections associated with oil and gas 6 Dahlgren, D.K., Messmer, T.A., Crabb, B.A., Larsen, R.T., Black, T.A., Frey, S.N., Thacker, E.T., Baxter, R.J., and Robinson, J.D., 2016, Seasonal movements of greater sage-grouse populations in Utah-Implications for species conservation: Wildlife Society Bulletin, v. 40, no. 2, p. 288-299 (emphasis supplied). https://onlinelibrary.wiley.com/doi/abs/10.1002/wsb.643 7 M. Holloran et al. Letter to the Honorable Ryan K. Zinke (June 8, 2018). 8 NV DEIS Appendix B at B-1; Utah DEIS Appendix B at B-1. 9 P.S. Coates et al. Evaluating Greater Sage-Grouse seasonal space use relative to leks: Implications for surface use designations in sagebrush ecosystems: Journal of Wildlife Management, v. 77, p. 1598-1609; see also D.K. Dahlgren et al. infra note 9. 10 See, Green, A.W., Aldridge, C.L., and O'Donnell, M.S., 2017, Investigating impacts of oil and gas development on greater sage-grouse: Journal of Wildlife Management, v. 81, no. 1, p. 46-57 (Finding that oil and gas developments Detailed Comments on NV-CA DEIS The Nature Conservancy 4 of 23 development are reliably applied and, as a result, that waivers, exceptions and modifications are not broadly used to weaken those protections. While we can accept narrowly prescribed waivers, exceptions and modifications to lease stipulations that are based on very specific criteria, broad standards, such as those currently included in the Nevada Draft RMP Amendment/EIS are not acceptable.

Pages 2-8, 2-9 (pdf 46-47) discuss hard and soft triggers ("signals" per Coates et al. 2017), and refer to Appendix D, which is also referred to as the Adaptive Management Strategy., We note as a preface to our comments on Appendix D, that the Map in Appendix D, as with Coates et al. 2017, do not remove non-habitat that is the Interstate 80 corridor. Further, as can be seen from RMPA Map 1-1, there is a 6 mile corridor of checkerboard and/or private lands on each side of the Interstate that is not "masked

over", as put by Coates et al. 2016, 2017. 26. We also note as a preface, that Coates et al. 2014 and 2016 and 2017 continue to (1) arbitrarily expand sage-grouse habitat by 10 kilometers beyond the boundaries of the Population Management Units described by NDOW, in collaboration with local working groups. Maps based upon an arbitrary definition of habitat can only be found to be arbitrary and erroneous. While Coates et al. 2016, 2017 claim to have accounted for major freeways, they do not, and they do not account for the 6 miles of checkerboard and/or private lands on each side of the Interstate Freeway. Compare Map Figure 1-1 to Coates et al. 2017 maps, also found in Appendix D. 27. Page 2-8 (pdf 46). The phrase "biologically significant unit" is not used by Coates et al. 2017. Further, Coates et al. 2017 appear to consider all seven of their habitat groupings, from the lek to the entire Nevada and northeast California region, to be "biologically significant units". The RMPA should refrain from characterizing these authors' "climate clusters" as "biologically significant units". Instead, the RMPA should use the same phraseology used by Coates et al. 2017. This will minimize confusion between the research conducted and the RMPA. APPENDIX B. 28. Throughout Appendix B, the word "lek" or "leks" should be changed to "active or pending lek(s)". 29. Because Appendix B provides that there exist multitudes of variation that might alter consideration of the lek buffer distances. BLM should develop a checklist for these lek buffer distances, as it has for RDFs in Appendix C. 9 | Page 30. Throughout Appendix B, where used, the phrase "active or occupied" should be replaced with "active or pending". 31. Appendix B should add the assurance that, if and when a population of sage-grouse begin using the area around a developed livestock water trough (as is known to occur), that the Permittee will not be required to cease use of the trough for livestock watering, and will not be required to change season of use of the area serviced by the trough. It is rational to conclude that, if the presence of the trough and its associated grazing use has created a zone that sage-grouse find desirable for lekking, then the existing grazing use has increased the lek habitat availability, and such activity should continue.

APPENDIX C 32. The heading of the RDF worksheet should make clear that the RDFs (may) apply to new structures, but not existing structures.

Appendix D is not consistent with Coates et al. 2017. Coates et al. 2017 do not state, relative to soft signals, that "management changes are needed at the project or implementation level." Coates et al. 2017 in fact state that a soft signal could be set off by poor lek counting, or a number of other reasons (see Coates et al, 2017, page 2 (pdf 12)). Coates et al. 2017 also specifically "did not evaluate management effectiveness of soft signals because they are intended to identify populations that are steadily declining and perhaps require more monitoring and 10 | Page localized threat assessment before implementing any management action." Coates et al., page 26 (pdf 36). 37. Appendix D is also remiss in not adopting the "early warning system" as it is more fully expressed in Coates et al. 2017, which requires some self-examination of the underlying data in their "soft warnings" and "hard warnings". Coates et al. 2017 state: "However, identification of trends that signal population decline may need to be tempered using safeguards that protect against implementing action too soon owing to short-term population dynamics or errors in lek counts, or because local populations are simply tracking population trends occurring at broader spatial scales driven by less-manageable stochastic factors (for example, population cycles driven largely by variation in climate)." Coates et al. 2017, pages 6-7 (pdf 16-17). Thus, Coates et al. 2017 provide for "safety stops" that are intended not to act too soon to a perceived decline, and secondly not to act too late for a more-likely real decline for a particular lek, lek cluster, or large grouping. 38. While we continue to contend that Coates et al. 2014, 2016, and 2017 rely upon an arbitrary expansion of sage-grouse habitat (adding 10 km to the edge of the PMUs determined by NDOW, in concert with local sage-grouse working groups), nevertheless, Coates et al. 2017 provide a

rational set of thresholds, warnings, and signals, including "safety stops", which are not reflected, but should be, by Appendix D and the body of the RMPA. See Coates et al. 2017 page 2 (pdf 12).

Appendix D also does not explain why the smallest examination of triggers will be the lek cluster, rather than the lek, which seems to be the logical place to start. (See Section D.5.1, D.5.2).

Appendix D (or the body of the DRMPA) does not reveal any contemplated actions for areas with less than 25% sagebrush cover, but does not explain a reason for this. 42. Appendix D (or the body of the DRMPA) does not explain the rationale for cut-off for response actions. In other words, what is the rationale for the 65% threshold between response actions? 43. Coates et al. 2017 expressed 5 caveats to their analysis; therefore, these authors recognized problems and issues with their own analysis. These caveats should be considered in the application of Coates et al. 2017, and the RMPA should make this explicitly clear.

ES-1 ES-2 P 1, Lines 1-2 In addition to the provided list, the BLM's efforts through the Management Alignment Alternative also seek ways of incorporating additional/new information and ever-evolving "best available science" in an effective and efficient manner. These points should be added to this paragraph / sentence.

Chapter Page Paragraph / Line / Figure / Table Comment 2.3.2 2-3 P 2 Where deemed appropriate in this section, NACO suggests adding language that reads, "…allowance for ground truthing presence of GRSG habitat before a final implementation decision is made…" Please See County Needs Attachment 2 2-3 P 2 Revise to read "…based on the most updated best available science and habitat data…." See explanations above regarding plan maintenance. 2 2-3 P 2 The sentence should include "…revision and simplifying an allocation exception process to allow for the consideration of projects (, public health / safety and administrative functions that serve a public purpose) within designated Habitat Management Areas…". 2 2-5 Table 2-1 Table 2-1 lists a suite of Land Use Plan Allocations and terms such as "retain (land tenure), avoidance, exclusion, open with minor/major stipulations, limited, closed and not available" regarding allocations within mapped PHMA, GHMA, and OHMA. The State Plan does not contain similar allocations restrictions, and therefore this table is inconsistent with the State Plan. NACO appreciates and support the footnote added for the Management Alignment Alternative, and would request that the footnote specifically indicate ground-truthing of modeled habitat.

3 3-1 3.1.1 Section 3.1.1 focuses only on sage-grouse literature since 2015. USGS reports referenced only focus on science since Jan 2015. Eureka County (and others) submitted volumes of peer reviewed scientific papers that existed in 2015 that the BLM either omitted or ignored in the prior LUPA process. Our comment letter on the prior EIS specifically referenced this data along with scientific sources and asked for them to be included. NACO asks that the BLM now consider and synthesize this previously-submitted data demonstrating the previous EIS being flawed and not based on the best available science, incorporated herein by reference. See Eureka County Comments on DEIS, filed January 29, 2014, at 55-62. This science must also be considered and incorporated. Eureka County provided pages of information regarding this previously omitted science. The late Kent McAdoo and Dr. Sherm Swanson also provided information about the many papers and studies BLM failed to include. Also, Dr. Bill Payne, Dean of UNR CABNR, provided a review highlighting the previous omission of Nevada specific studies on sage grouse and various land use impacts to sage grouse, especially grazing. It is crucial that BLM consider and incorporate the previously omitted science and the new science since 2015. Given NACO's desire to apply Table 2-2 through the lens of ESD, associated State and Transition Models,

Disturbance Response Groups and current ecological state of the cite, it should also incorporate pertinent science specific to the proper application and implementation of such information and tools. This includes, but is not limited to the following studies: * BOLTZ, S., AND G. PEACOCK. 2002. Ecological sites: understanding the landscape. Rangelands 24:18-21. * BRISKE, D.D., B.T. BESTELMEYER, T.K. STRINGHAM, AND P.L. SHAVER. 2008. Recommendations for development of resilience based state-and-transition models. Rangeland Ecology & Management 61:359-367. * SOIL SURVEY DIVISION STAFF. 1993. Soil survey manual. Soil Conservation Service US Department of Agriculture Handbook 18. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, C. COOMBS, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models, Major Land Resource Area 28A and 28B Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-01. p. 1524. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models by disturbance response groups, Major Land Resource Area 25 Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-02:572. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, D. SNYDER, S. PETERSON AND K. SNYDER. 2016. Disturbance Response Grouping of Ecological Sites Increases Utility of Ecological Sites and State-and-Transition Models for Landscape Planning in the Great Basin. Rangelands 38(6):371-378.

The Science Cited Never Supported SFA Boundaries The withdrawal process adopted wholesale the assumption that the SFAs constitute the best habitat for Sage Grouse; and that it can only be protected by withdrawal. While it is important to work closely with the FWS to implement regulatory assurances like the State Plan, to continue to conserve GSG habitat and to avoid a future listing, the BLM must make explicit reference to the scientific and other sources relied upon for conclusions in the statement. 40 C.F.R. § 1502.24. The SFA Boundaries included lands that were not GSG habitat because it was based on facially erroneous data that identified areas of non-habitat as critical GSG habitat. The threat to sage-grouse that the SFA withdrawal was meant to protect against is habitat fragmentation, yet the Agency could not calculate the impact to sage-grouse because it was too negligible. The Need for any withdrawal is to prevent the fragmentation of greater sage-grouse habitat caused by surface disturbance within the habitat area: "One of several major threats to public lands identified in the LUP amendments is the fragmentation of greater sage-grouse habitat due to mineral exploration and development related to hard rock mining." During the SFA Withdrawal process, NACO asked the BLM why habitat fragmentation had not been analyzed. To summarize, the response was "the area is too big," and "we do not know where the disturbance will occur" to calculate or map potential impacts from disturbance.18 This makes sense, considering the disturbance-to-withdrawal ratio is so small that it didn't even compute. This information is crucial to the impacts analysis, as disturbance is only relevant to determine to what extent mining contributes to habitat fragmentation. This conclusion is consistent with the FWS's initial findings on March 23, 2010 for petitions to list the Greater Sage-Grouse as Threatened or Endangered at 75 Fed. Reg. 13910, which highlights that the FWS did not "have comprehensive information on the number or surface extent of mines across the range," but that "Nevada (MZs III, IV, and V) is ranked second in the United States in terms of value of overall nonfuel mineral production in 2006 (USGS 2006, p. 10)." On October 2, 2015, the FWS issued another finding stating that "Consistent with our 2010 finding, we do not have a comprehensive dataset about existing and proposed mining activity to do a quantitative analysis of potential impacts to sage-grouse." 80 Fed. Reg. 59,915 (Oct. 2, 2015) "…Overall, the extent of [mining] projects directly affects less than 0.1 percent of the sage-grouse

occupied range. Although direct and indirect effects may disturb local populations, ongoing mining operations do not affect the sage-grouse range wide." 80 Fed. Reg. 59,858. Also, USFWS quantified the huge area of the western U.S. that contains GSG habitat: "The sagebrush ecosystem upon which the sage-grouse depends remains one of the largest, most widespread ecosystems in the United States, spanning approximately 70 million ha (173 million ac)". 80 Fed. Reg. 59,933]. This information was provided prior to further information obtained through the Mineral Potential Report and Socioeconomic Impacts Analysis. The COT Report Supports Only Localized, Not Widespread Risk of Mining in SFAs The withdrawal proposal relied on the recommendations from A Report on National Greater SageGrouse Conservation Measures, Sage-grouse National Technical Team (December 21, 2011) (NTT Report) and Greater Sage-grouse (Centrocercus urophasianus) Conservation Objectives: Final Report, U.S. Fish and Wildlife Service (February 2013) (COT Report). NACO and Nevada's Counties have in the past expressed many concerns with the ARMPA's reliance on the NTT and COT Reports as conflicting with the Sagebrush Ecosystem Council and Sagebrush Ecosystem Technical Team findings supporting the State of Nevada's Action Plan. greater sage-grouse habitat - this could include fragmentation of seasonal habitats (i.e., nesting/brooding and winter) and connected populations (i.e., leks); and (3) Calculations of vegetation/habitat impacts relative to the availability of these resources within the proposed withdrawal area. 18 Discussion from a Cooperating Agency Call, on Thursday, March 23 at 12:30 PM PST. Nevertheless, the ARMPA cites to those reports, and therefore they should be used to determine whether the scale of the SFAs and the widespread proposed withdrawal were supported by the science cited. The NTT Report does propose a "withdrawal from mineral entry based on risk to the sage-grouse and its habitat from conflicting locatable mineral potential and development." However, the NTT report does not discuss where a withdrawal might be most appropriate or imply that it should cover 10 million acres of habitat nationwide. Rather, the FEIS and ARMPA rely upon the COT Report to determine the NTT's request to evaluate risk from conflicting locatable mineral potential and development. Looking to the COT report, the SFAs do not represent the areas at greatest risk from mining. The COT Report shows that threats from mining within the SFA areas are only localized and not widespread. Table 2 delineates Sage-grouse quasi-extinction risk and threats by management zone and populations as defined by Garton et al. 2011. Threats are characterized as (Y = threat is present and widespread), (L = threat present but localized), (N = threat is not known to be present), and (U = unknown). Figure 3 complements this table by designating Sage-grouse management zones, populations, and Priority Areas for Conservation. This table correlates to the threats present in each management zone. The Sage-Grouse Priority Areas that encompass the SFAs are numbered 26a (Northern Great Basin) and 31 (Western Great Basin). The threat of mining to is designated "L," or "threat present but localized" in both the Northern and Western Great Basins, even where the threat of mining is only elevated to "present and widespread" in management area 14 (Northwest Interior) which is not an SFA. In fact, the only areas on the map within the COT report that expresses a widespread threat of mining is in the Northwest Interior. This area, the Northwest Interior, is home to mining operations run by Newmont Mining Corporation, a company engaged in an Enabling Agreement that allows for mitigation and net conservation gains from mining threats to Greater Sage Grouse (See Section C on Cooperating Agreements). Another Enabling Agreement between the BLM and Barrick Gold Corporation covers Sage-Grouse habitat in an area with the exact same characteristics as those subject to the SFA. If a cooperating agreement with mitigation requirements with a private party is sufficient to protect an area with a widespread threat of mining, then it is insufficient to conclude that that some areas labeled as having a "localized" threat of mining should be subject to a widespread withdrawal lasting twenty plus years.25 Mitigation measures similar to those in the Newmont and Barrick Enabling Agreements could be applied to mining projects in the SFA, with a similar positive

outcome. Therefore, the COT Report does not support a need for widespread withdrawal above and beyond the many measures being implemented in the Northern or Western Great Basin Priority Areas. The FWS Listing Decision Does Not Support the SFA Boundaries In 2010 the FWS was aware only "of approximately 63,000 acres of existing mining related disturbance within the range of sage-grouse."26 The notice indicates that mining related disturbance has not changed. Yet the FWS supports its own "recommendations for mineral withdrawal in SFAs that would remove potential impacts on approximately 10 million acres of sage-grouse habitat." 27 The FWS only concludes with reference to the Ashe Memo that "The Federal Plans designate the most important sagebrush habitat as SFAs where locatable mineral withdrawal is recommended… Within the areas of greatest conservation importance (SFAs), DOI will recommend withdrawal from locatable mineral entry." The findings again state that the threat of mining is localized rather than widespread. The FWS notes its findings are consistent with the recommendations in the COT Report, that "Minerals are not distributed evenly across the sage-grouse landscape, and as a result, mining activities tend to be localized or regional." 80 Fed. Reg. 59,915; See previous citations about mining impacting 0.1% of the 173 million total acres of greater sage-grouse habitat. Again, an Agency may not adopt wholesale another Agency's conclusions unless those conclusions are supported by the best available science. 40 C.F.R. § 1502.24. The FWS listing decision at 80 FR 59872 discusses the COT Report and new scientific information. Even here the findings reference the Ashe Memo discussed above to support the strongholds.28 This Memo, as discussed above, does not support the strongholds with any citation to science or supporting analysis. Because the FWS never supported its request to add the strongholds with scientific citation or analysis, the BLM may not rely on the FWS's conclusion or request to support the strongholds.

We also recommend that the 2018 FEIS incorporate by reference the October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment that the U.S. Geological Survey ("USGS") prepared for BLM. In our comments on the 2015 FEIS, we stressed that one of the many reasons the document was insufficient and did not comply with NEPA was because it lacked https://pubs.usgs.gov/sir/2016/5089/b/sir20165089b.pdf sections describing the Affected Environment and Environmental Consequences to Geology and Mineral Resources. Incorporating the October 2016 USGS Mineral Potential Report would cure this deficiency. It is not currently included in the references section in the 2018 DEIS or specifically incorporated by reference and needs to be added.

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3 3-2 Bullet 2 We have strong concern with the following statement, "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late broodrearing across all sites." Please remove this statement and replace with "selection and positive survival relationships with vegetation (grass and shrub) cover during nesting and late broodrearing across still exist. Evidence for a ubiquitous positive relation between grass height and nest success was either greatly diminished (Gibson and others, 2016a) or not supported (Smith and others, 2017b), although some studies that corrected for phenology still support this relation (Smith and others, 2017b; Coates and others, 2017a). Indicator values for grass height need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors and are geographically appropriate." The second bullet mischaracterizes Gipson et al (2016) and links Gipson to the conclusion that "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late brood-rearing across all sites." Yet, the USGS points out many studies that do not necessarily make this conclusion. USGS explicitly states that "Indicator values for grass height contained in the habitat objectives tables of the 2015 BLM land use plans…may need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors (Gibson and others, 2016a) and that science findings are geographically appropriate." Examples referenced and discussed by USGS include Gipson et al. (2016) and Smith et al. (2017). Gibson et al. (2016), concluded that "the correlation between grass height and nest success could instead be due to a built-in bias in timing of when vegetation is measured around hatched and Page 33 of 89 failed nests. If habitat measurements are made immediately after researchers determine fate of a nest (either failure or hatch), measurements may be taken weeks later at successful nests than at failed nests, which allows grasses more time to grow. Because the nesting season occurs in the spring during green-up - when grasses can grow more than a half an inch a week - it appears that hatched nests are surrounded by taller grass. Dr. Gibson's study suggested this timing bias is the reason that so many studies have concluded that tall grass is important for concealing nests from predators" (as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height

Measurements, Science to Solutions Series Number 15, at 4 (2017)). Smith et al. (2017) "re-analyzed data from three independent studies that previously showed a correlation between grass height and nest success. Smith and his team reevaluated data from studies in the Powder River Basin of southeast Montana and northeast Wyoming (Doherty study), Smith's own research in central Montana, and a site in northeast Utah. When combined with Gibson's research in Nevada, the studies encompassed 1,204 sage grouse nests over 24 study site-years from across the range of sage grouse. In Gibson's study, measurements of vegetation were made at the expected hatch date for all nests, regardless of their actual outcome. This minimized any difference between failed and hatched nests in when vegetation was measured. Gibson then used a linear regression to predict vegetation height at the date of nest fate, simulating the biased methods common in other sage grouse nesting studies. For his study, Smith used the data that was collected at nest fate - the biased way - and applied the reverse correction to obtain grass heights as though they had been sampled using unbiased methods. Smith found that, when uncorrected, all of the datasets revealed a strong correlation between grass height and nest success. However, following the simple correction to account for bias, there was no longer any association between grass height and nest success in two of the three studies, while the association was slightly reduced in strength but still apparent in the third Powder River Basin. At hatch date, median grass heights at hatched and failed nests were within just 0.05 inches of one another across all re-analyzed datasets. Overall, the research strongly affirmed Gibson's initial findings and suggests that the height of grass is not nearly as crucial to sage grouse nesting success as previously thought" (also as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height Measurements, Science to Solutions Series Number 15, at 4 (2017))

Appendix A Figure 1-2a Apply to all similar maps: Please map the overall Habitat Management Area (HMA), assumed to be the overall extent (perimeter) of Habitat Area, for sake of clarity. Appendix A Figure 1-2b Apply to all similar maps: Please map the overall Habitat Management Area (HMA) for sake of clarity. This should match the Sage-grouse Management Area (SGMA) now referred to as the Sage-grouse Management Category Area (SGCMA), or spatial extent (overall perimeter) of GRSG management in Nevada, as adopted by the Sagebrush Ecosystem Council in December 2015. Appendix A Figure 2-2a It should be noted that there is mapped habitat from Figure 1-2a that falls outside of the BSUs and Lek Clusters. Appendix A Figure 2-2b It should be noted that portions of the updated BSUs and Lek Clusters fall outside of the HMA (BLM) or SGCMA (Nevada Plan). The HMA/SGCMA boundary should be added to this map to better illustrate this issue. Appendix A Figures 2-3b to 2-13b All "Allocation Specific Maps" under the Management Alignment Alternative should include a note under any mapped allocation restriction (i.e. closed, exclusion, avoidance, retention, limited, etc.) Page 41 of 89 that such allocations restrictions are subject to ground-truthing of mapped / modeled habitat as well as the exception process.

The OMB standard was not followed in the peer review of the so called "best available science" throughout the DEIS. For example, both the Sage-Grouse National Technical Team Report (NTT Report) and the FWS Greater Sage-Grouse Conservation Objectives Final Report (COT Report) are heavily relied throughout the DEIS alternatives but these documents did not follow the OMB standard for peer review. We point out specific issues related to both reports and other science in the DEIS in more detail below. Scientific research and documentation used within the DEIS is limited in scope to repetitive authors and does not adequately incorporate recent rangeland research or current understandings of rangeland dynamics and largely omits rangeland scientists and other rangeland

professionals. Proper peer review and adoption of the full range of best and current science is necessary for consideration and adoption by BLM prior to the Final EIS and ROD.

Selection of the proper inventory or monitoring techniques and interpretation of the data will only be acceptable when performed by people whose judgment is the result of successful experience and well developed skills. Technical guidance as found within peer reviewed scientific publications and various agency or interagency handbooks and manuals serves as reference material and may be incorporated into this document upon approval by the Board of Eureka County Commissioners. Suitable reference material is included as attachments to Page 58 of 89 this plan or by reference within the text. Reference material includes, for example: the Nevada Best Management Practices, USDA Natural Resource Conservation Service Range and Pasture Handbook, Nevada Rangeland Monitoring Handbook (1984 First Edition or 2006 Second Edition), Standards and Guidelines for Grazing Administration as written by the Association of Rangeland Consultants, March 12, 1996, Standards and Guidelines as written by the Northeast Great Basin Resource Advisory Council. o There is limited to no mention or incorporation of these peer reviewed and technically sound references that were developed specifically for Nevada.

"Monitoring: Document ecological status and trend data obtained through rangeland studies supplemented with actual use, utilization (use pattern mapping), and climatic data in accordance with the Nevada Rangeland Monitoring Handbook; Document ecological sites or forage suitability groups, and ecological similarity index as defined by NRCS National Range and Pasture Handbook, with specific reference to ecological status and trend data and "State and Transition" interpretations of ecological status; Document progress in the development and implementation of Allotment Management Plans; Document the development and implementation of Pinyon pine, juniper, and shrub abatement, control, or harvest plan(s); Annually review and document wild horse herd population inventories, and conduct inventories when necessary, including reports of wild horse movement, grazing habits, numbers and other data provided by permittees, lessees and landowners" (p. 6-11) These required monitoring components have not been completed as required by our Master Plan and therefore, the analysis is lacking and flawed since the data was minimal and the data quality going into the development of the DEIS was poor.

"Identify and initiate reductions in stocking levels only after monitoring data demonstrates that grazing management including range improvements and specialized grazing systems are not supporting basic soil, vegetation and watershed goals" (p. 6-14). o The monitoring proposals in the DEIS focus on blanket criteria, utilization standards, and indicator based approaches. These are fine only as long as they help focus where additional monitoring is needed and to make adjustments in management along the way. The DEIS proposed to reduce and restrict grazing based on these subjective monitoring techniques. Trend monitoring, over multiple years, and objective monitoring of ecosystem function is imperative before any reduction or restriction in grazing. Snapshot monitoring at one point in time (as is often the case with the qualitative techniques) does not inform on whether progress is being made towards objectives and standards.

Any future adjustments should be based on the best available science developed and refined by local experts and partners specific to the habitat and conditions found in Nevada, rather than other habitats located outside of the Great Basin.

C.3.6 Disturbance and Density Caps

No surface occupancy stipulations must be maintained for oil and gas development in priority habitats. Preventing destruction of greater sage-grouse habitat is critical to avoiding harm while permitting development.

Existing disturbance caps must be maintained to limit harm to habitat. Disturbance caps serve as a backstop that limits harm to habitat and provides needed certainty.

BLM acknowledges the changes in Utah "could result in a site-specific loss of Greater Sage-Grouse habitat and displacement from the area of development by local populations."90BLM also admits that, "Projects that would likely be precluded under the No Action Alternative could proceed under the "2018 proposed amendments."91BLM reasons, however, that requiring that impacts improve habitat will offset those concerns. There are significant problems with the agency's reasoning because the Draft Utah mitigation rule does not provide a preference for offset benefits to accrue within the landscape affected by the project; prioritize projects that provide the greatest benefits, and reduce the greatest threats, to sage-grouse habitat; does not require mitigation for all impacts; does not guarantee against temporal losses; does not use a habitat quantification tool to measure comparability between impacts and offsets. BLM also notes the requirement to avoid development within priority habitat, but this development would expressly occur within priority areas. The DEIS also provides new opportunities for waivers, exceptions, modifications for siting projects in priority habitat.93

In Idaho, the DEIS states: Removal of the 3 percent project level disturbance cap would allow BLM to intentionally cluster developments within areas already degraded by discrete anthropogenic activities in Greater Sage- Grouse habitat as long as the overall disturbance within the BSU remains below 3 percent. The 3 percent project scale disturbance cap has the potential to spread development into undeveloped areas of Greater Sage-Grouse habitat just to avoid reaching the 3 percent project scale disturbance cap in already fragmented areas. All 8 BSUs in Idaho are well under the 3 percent BSU scale Disturbance Cap (most are less than 1 percent) and are expected to remain low because of the nonet-loss mitigation standard and the other restrictions to development in PHMA and IHMA. Some areas, especially those with existing development, may be further developed even though compensatory mitigation would offset those impacts for the statewide Greater Sage-Grouse habitat.94 Essentially, Idaho has come up with a standard that for the foreseeable future will never disallow a project because the priority area densities are so low, even though the density of an individual project area may be high. This flies in face of studies showing impacts to sage-grouse because of individual project density, and Edmunds study that there can be differences between densities at large and small-scale levels that are significant. Also, Idaho's mitigation program is not finalized, and there is no time line by which it is guaranteed to be finalized; thus, we do not know what provisions it will or will not include. As a result, we oppose these amendments to the land use plan, both because they will reduce important protections for sage-grouse, and because they make it more likely that the bird will need to be listed under ESA.95

IX. DENSITY AND DISTURBANCE CAPS SHOULD BE MAINTAINED. The DEISs propose changes in Utah and Idaho to the density and disturbance caps set out in the 2015 BLM sage-grouse land use plans limiting the amount of development that can take in priority habitat management areas. We oppose these changes, for the reasons set out below. 66 The decision by the FWS not to list sage-grouse under the ESA noted the importance of the caps to sagegrouse protection: Each Federal Plan includes a disturbance cap that will serve as an upper limit (the maximum disturbance permitted). Anthropogenic

disturbance has been identified as a key impact to sagegrouse. To limit new anthropogenic disturbance within sage-grouse habitats, the Federal Plans establish disturbance caps, above which no new development is permitted (subject to applicable laws and regulations; e.g., General Mining Law of 1872, and valid existing rights). This cap acts as a backstop to ensure that any implementation decisions made under the Federal Plans will not permit substantial amounts of new disturbance within the distribution of sage-grouse on BLM and USFS

C.3.7 Fire and Invasive Species

A more specific approach to managing noxious weeds and invasive species should be developed and included to address this significant threat. The 2018 report issued by Western Association of Fish and Wildlife Agencies (updating a 2013 report) summarizing policy, fiscal and science challenges land managers have encountered in control and reduction of invasive grasses and fire cycle, with a focus on the greater sage-grouse found ongoing gaps and also recommended that the agencies continue working on a "landscape-scale approach to fire and land management and further enhance collaborative, science-based approaches to management activities within the Sagebrush Biome." 2018 Gap Report, p. 46. Following these recommendations and committing to developing a more detailed strategy is needed.

C.3.8 General Habitat Management Areas

A just-released U.S. Forest Service study (Cross 2018) attempted to quantify the importance of connectivity across the sagebrush range .61 Scientists set out to map the mating areas called "leks" and identify the birds that use each of these areas. They grouped 1,200 leks into "nodes," or a collection of leks, within the network of greater sage-grouse. The nodes were then categorized as "hubs" or spokes" based on their importance to facilitating gene flow within and across the range of sage-grouse. Hubs foster gene flow out to the spokes. If a hub were to be lost, the birds in the connected spokes would be at risk of genetic isolation. The two maps below depict (1) the location of general habitat in Utah under the 2015 BLM sage-grouse land use plans, with the pink areas representing general habitat,62 and (2) a figure depicting the overall ranking of node importance to genetic connectivity across the contiguous range of greater sage-grouse, as measured by "betweenness" calculated in Cross et al. 2018.63 As the maps reveal, the Forest Service found hubs across the bird's range, with a concentration in northwestern Utah, where protection of general habitat is particularly important. Areas is northeastern Utah also show up as corridors of genetic connectivity to Colorado. Even where general habitat is not important for connectivity between populations, as is in central Utah, general habitat is important for providing links between different priority habitat areas within Utah. Similarly, hubs were also concentrated in central Idaho, where large swaths of general habitat are located.64 *See attachement, Map* Given the role general habitat plays in preserving connectivity between populations, as well as the other purposes it serves, it would be a grave mistake to eliminate, or even reduce, protections for these areas. In addition, the importance placed on general habitat by the Fish and Wildlife Service raises the concern that the proposed changes will lead to a greater chance of listing sage-grouse under the ESA. The proposed amendments to eliminate or reduce protections for general habitat should therefore be rejected.

CPC strongly supports the intent of the DRMPA to improve the alignment between individual state plans and/or conservation measures, and DOI and BLM policy. States have authority for managing wildlife populations and work with local governments and stakeholders to balance conservation and business development practices in consideration of their socioeconomic impacts.

Of the more than 48 million acres in the Utah Subregional Planning Area, only about 580,000 are in general habitat, as are another 225,000 acres of mineral estate.55Eliminating general habitat in Utah would mean, for example, that mitigation, including avoidance, minimization and compensatory mitigation, as well as minimal Required Design Features (RDFs), are not required in those areas, regardless of the impact to sage-grouse populations or sagebrush habitat. It would also preclude application of precautionary measures such as avoiding removal of sagebrush and minimizing development that creates a physical barrier to sage-grouse movement.56For areas constituting such a small percentage of Utah's land base, it makes no sense to skimp on protections that could both prevent further reductions in Utah's sage-grouse populations and avoid imposing additional burdens on neighboring states still required to manage general habitat for sage-grouse. This is particularly true given the importance of general habitat in Utah and other sagebrush steppe states for sage-grouse connectivity. Sage-grouse select large intact sagebrush landscapes.57The USGS Synthesis has confirmed the importance of maintaining connectivity between different sage-grouse populations to conserve genetic diversity.58A 2015 study found that long-distance movements of GRSG have been documented, but the risk associated with the landscapes that the birds traverse is not well understood. The current designated priority area strategy does not protect movement corridors among priority areas, and some areas may be at risk of isolation even when they are not separated by large distances.59 A 2016 study covering Idaho, Utah and Wyoming showed that several sage-grouse moved 100 km north and west, traversing from the Wyoming Basin to a range typically associated with the Snake River Plain, and theorized that these migrating birds may serve as an important genetic link between two sage-grouse management zones.60 A just-released U.S. Forest Service study (Cross 2018) attempted to quantify the importance of connectivity across the sagebrush range.61Scientists set out to map the mating areas called "leks" and identify the birds that use each of these areas. They grouped 1,200 leks into "nodes," or a collection of leks, within the network of greater sage-grouse. The nodes were then categorized as "hubs" or spokes" based on their importance to facilitating gene flow within and across the range of sage-grouse. Hubs foster gene flow out to the spokes. If a hub were to be lost, the birds in the connected spokes would be at risk of genetic isolation.

The two maps below depict (1) the location of general habitat in Utah under the 2015 BLM sage-grouse land use plans, with the pink areas representing general habitat,62and (2) a figure depicting the overall ranking of node importance to genetic connectivity across the contiguous range of greater sage-grouse, as measured by "betweenness" calculated in Cross et al. 2018.63 As the maps reveal, the Forest Service found hubs across the bird's range, with a concentration in northwestern Utah, where protection of general habitat is particularly important. Areas is northeastern Utah also show up as corridors of genetic connectivity to Colorado. Even where general habitat is not important for connectivity between populations, as is in central Utah, general habitat is important for providing links between different priority habitat areas within Utah. Similarly, hubs were also concentrated in central Idaho, where large swaths of general habitat are located.64 [See Attachment PG 37 and 38] Given the role general habitat plays in preserving connectivity between populations, as well as the other purposes it serves, it would be a grave mistake to eliminate, or even reduce, protections for these areas. In addition, the importance placed on general habitat by the Fish and Wildlife Service raises the concern that the proposed changes will lead to a greater chance of listing sage-grouse under the ESA. The proposed amendments to eliminate or reduce protections for general habitat should therefore be rejected.

VII. GENERAL HABITAT MANAGEMENT AREAS SHOULD BE MAINTAINED. The Utah DEIS would eliminate all protections for general habitat.47Other states would weaken protections for sage-grouse in

general habitat;48Idaho, for example would eliminate lek buffers, reduce the application of required design features, and eliminate compensatory mitigation in general habitat.49For the reasons set out below, we oppose any reduction of protection for general habitat. While General Habitat Management Areas (GHMA) represent areas with fewer leks and lower densities of breeding birds where disturbance is limited, and provide greater flexibility for land use activities,50their designation is still important to sage-grouse conservation. The FWS 2015 Sage-grouse Listing Decision states: The designation as GHMAs provide sage-grouse conservation by protecting habitat and connectivity between populations and potential refugia in the event of catastrophic events such as wildfire. While the amelioration of threats in GHMAs will likely be less than in PHMAs due to less stringent required conservation measures, GHMAs do have restrictions that benefit sage-grouse conservation.51 It is important to ensure that seasonal habitats not included in priority areas receive some protection,52and to allow for expansion of recovering populations into newly restored areas. In addition, general habitat can serve as a location for compensatory mitigation offsets and restoring degraded habitat.53The recent USGS synthesis of recent science on sage-grouse recently stated: Maintaining connectivity among (priority areas) through restoration activities or conservation of existing sagebrush communities at important "pinch points," where movements are constrained, is an important component of an overall sage-grouse management strategy. Maintenance or restoration of habitat quality within corridors is important to limit exposure to risk (for example, from predators), and because sage-grouse use these sites as resting and refueling areas.54

In addition, general habitat can serve as a location for compensatory mitigation offsets and restoring degraded habitat.53 The recent USGS synthesis of recent science on sage-grouse recently stated: Maintaining connectivity among (priority areas) through restoration activities or conservation of existing sagebrush communities at important "pinch points," where movements are constrained, is an important component of an overall sage-grouse management strategy. Maintenance or restoration of habitat quality within corridors is important to limit exposure to risk (for example, from predators), and because sage-grouse use these sites as resting and refueling areas.54 Of the more than 48 million acres in the Utah Subregional Planning Area, only about 580,000 are in general habitat, as are another 225,000 acres of mineral estate.55 Eliminating general habitat in Utah would mean, for example, that mitigation, including avoidance, minimization and compensatory mitigation, as well as minimal Required Design Features (RDFs), are not required in those areas, regardless of the impact to sage-grouse populations or sagebrush habitat. It would also preclude application of precautionary measures such as avoiding removal of sagebrush and minimizing development that creates a physical barrier to sage-grouse movement.56 For areas constituting such a small percentage of Utah's land base, it makes no sense to skimp on protections that could both prevent further reductions in Utah's sage-grouse populations and avoid imposing additional burdens on neighboring states still required to manage general habitat for sage-grouse. This is particularly true given the importance of general habitat in Utah and other sagebrush steppe states for sage-grouse connectivity. Sage-grouse select large intact sagebrush landscapes.57 The USGS Synthesis has confirmed the importance of maintaining connectivity between different sage-grouse populations to conserve genetic diversity.58 A 2015 study found that long-distance movements of GRSG have been documented, but the risk associated with the landscapes that the birds traverse is not wellunderstood. The current designated priority area strategy does not protect movement corridors among priority areas, and some areas may be at risk of isolation even when they are not separated by large distances.59 A 2016 study covering Idaho, Utah and Wyoming showed that several sage-grouse moved 100 km north and west, traversing from the Wyoming Basin to a range typically associated with

the Snake River Plain, and theorized that these migrating birds may serve as an important genetic link between two sage-grouse management zones.60

C.3.9 Habitat Boundary/Habitat Management Area Designations

For larger adjustments, NEPA and BLM planning rules and procedures should apply, requiring a plan amendment and public engagement, as well as the following provisions, before any adjustment of habitat management boundaries: * Federal, state, and local agencies, and other interested stakeholders, should have the opportunity to participate. * There should be public notice of proposed changes, and an opportunity for the public to comment. * Adjustments should be based on the best available, science-based information, including all applicable peer-reviewed research papers. * Review of boundaries would occur every five years, unless more frequent adjustments are necessary, as determined by BLM and the relevant state agency * Boundaries would generally not be adjusted to exclude non-habitat areas if those areas are wholly contained within existing management boundaries. * Areas within habitat management boundaries not currently used by sage-grouse but ecologically capable of supporting sage-grouse would not be removed from existing management boundaries.153 As part of this process, states may convene working groups to recommend boundary adjustments, as long as the recommendations of those groups are made available to the public for comment. Because of the concern of a future listing under ESA, any changes should not represent a meaningful decrease in the current level of conservation under the 2015 Sage-grouse Plans. In the event that BLM wants to address the potential for broader habitat adjustments, then the agency can conduct additional analysis to evaluate the impacts of increasing and reducing habitat within a larger area (i.e., greater than 3% of the identified habitat management area polygon), which could then be tiered to for later adjustments.

The Plans manage PHMAs as right-of-way "avoidance areas" instead of exclusion areas (See, e.g., Wyoming RMPA FEIS at 2-25), as recommended by their own experts. This prevents certainty of implementation by allowing new rights-of-way to be granted on a case-by-case basis. "Exclusion" is the appropriate level of management for these habitats based on the best available science, and this level of protection should also apply to Focal Areas and Winter Concentration Areas as well. Only portions of General Habitats would be managed as avoidance areas for rights-of-way based on other resource values (See, e.g., Wyoming RMPA FEIS at 2-26); the importance of protecting sage grouse habitat merits avoidance management for all General Habitats.

XII. HABITAT BOUNDARY ADJUSTMENTS SHOULD BE BASED ON BEST AVAILABLE SCIENCE AND DATA, AND MADE WITH FULL TRANSPARENCY. All the 2018 DEISs except for the Oregon DEIS include provisions for adjustment of sage-grouse habitat management boundaries.150 We support transparent and consistent science-based efforts to ensure that any habitat management boundaries changes (1) represent the most available up-to-date and accurate information; and (2) do the most effective job possible of conserving sage-grouse habitat, and do not result in a meaningful decrease in the current level of conservation provided by the 2015 sage-grouse land use plans. Moreover, boundary adjustments and complementary adjustments of related management prescriptions should only be made to reflect a changed understanding of the preferences of the species and/or data showing changed use and conditions of habitat; adjustments may not be made to accommodate a proposed use that might otherwise be prohibited or conditioned based on a different habitat classification. We recognize that some changes to boundaries will be so small that they do not require a plan amendment. Plain maintenance procedures are available to refine or clarify a previously approved decision. BLM's regulations and Land Use Planning Handbook provide that "land use plan decisions and supporting

components can be maintained to reflect minor changes in data" but [m]aintenance is limited to further refining, documenting, or clarifying a previously approved decision incorporated in the plan."151 Examples of appropriate plan maintenance provided in the BLM Land Use Planning Handbook include "correcting minor data, typographical, mapping, or tabular data errors in the planning records after a plan or plan amendment has been completed" and "refining the known habitat of a special status species addressed in the plan based on new information."152 Such actions, which do not involve formal public involvement or NEPA analysis, should only be used for small boundary adjustments of an existing individual habitat management area. We propose that an adjustment (adding or subtracting acreage) comprising not more than 3% of an existing polygon would qualify as appropriate for a maintenance action.

C.3.10 Habitat Management Areas

All sage-grouse habitat must be subject to specific management approaches. While the strongest protections should continue to apply to the most important habitat, managing general habitat is also important for maintaining, improving, restoring and expanding habitat overall. Protections that were included in Sagebrush Focal Area designations should be incorporated into Priority Habitat Management Areas, where appropriate. The General Habitat Management Areas in Utah must be maintained; eliminating GHMA in Utah would hamper sage-grouse recovery in the state and have grave implications for habitat designations in other states. Similarly, proposals to remove management protections associated with GHMA in Idaho must not be adopted, since they effectively undercut the meaning of the habitat classification.

In addition, to meet the overall goals of the plans and habitat objectives to conserve, enhance and restore sage-grouse habitat, the plans should develop and incorporate specific restoration targets for PHMA to incentivize activities to reduce disturbance and the threat from noxious weeds.

C.3.11 Habitat Objectives

Specific habitat objectives for all aspects of the sage-grouse lifecycle should be defined, as discussed in the 2018 USGS report, which highlight the need to address the full range of sage-grouse habitat.

C.3.12 Lands and Realty

Sage-grouse habitat must be retained in federal ownership and not transferred to state control in order to maintain certainty of management across these lands, as well as habitat connectivity.

Sage-grouse habitat should be retained in federal ownership. The BLM's Scoping Report mentions the concerns of states such as Utah that maintaining sage-grouse habitat in federal ownership could affect the states' ability to develop land.67In fact, the Utah DEIS states: Increased potential for disposal and/or exchange of BLM-managed federal lands in [priority] and Greater Sage-Grouse habitat outside of [priority areas] could possibly result in expanded economic opportunities in the affected location… Possible land uses include use for county and municipal physical facilities, commercial or residential development,e and/or recreation use.68 These uses are all identified as threats to sage-grouse habitat in the 2013 Conservation Objectives Team (COT) Report, which developed range-wide conservation objectives for sage-grouse that define the degree to which threats needed to be reduced or ameliorated to ensure that the species was no longer in danger of an ESA listing. 69 It can be difficult under the standards proposed by BLM to determine if land disposal "will compromise" sage-grouse persistence, or have "no direct or indirect impact" on populations.70Retaining habitat in federal ownership helps ensure

the land will be managed as prescribed in the BLM land use plans, providing certainty. It also will promote connectivity of sage-grouse populations.71States have not committed to all the same management and approaches as BLM. Moreover, in some cases, such as for state trust lands, they are required to manage the lands to maximize revenues, which is likely inconsistent with conserving sage-grouse habitat. If there is a need to correct lands designated as sage-grouse habitat, we prefer it be accomplished through authorized habitat management boundary adjustments as provided for in the 2018 DEISs, consistent with our recommendations for how that process should be conducted. We also support the continued inclusion of provisions in the BLM plans that encourage acquisition of habitat where it will benefit sage-grouse populations.

VIII. KEEPING GROUSE HABITAT IN FEDERAL OWNERSHIP IS IMPORTANT FOR CONSISTENT MANAGEMENT AND CONNECTIVITY. The 2015 Utah sage-grouse land use plan provides that BLM cannot dispose of priority or general habitat, unless there are no impacts to sage-grouse or its habitat or there would be a net conservation gain to sagegrouse. The 2018 DEIS would change this provision to allow disposal if it improves the condition of sage-grouse habitat, or BLM can demonstrate disposal "will not compromise the persistence of Greater Sage-Grouse populations" within priority habitat. The 2015 Utah plans also support identifying areas where acquisitions or easements will benefit sage-grouse habitat, while the 2018 DEIS eliminates this provision.65 Similarly, the Nevada DEIS also allows disposal of sage-grouse habitat if it would have "no direct or indirect adverse impact on conservation of the Greater Sage-Grouse or can achieve a net conservation gain though the use of compensatory mitigation."66 We oppose these changes in the 2018 DEISs. Sage-grouse habitat should be retained in federal ownership. The BLM's Scoping Report mentions the concerns of states such as Utah that maintaining sage-grouse habitat in federal ownership could affect the states' ability to develop land.67 In fact, the Utah DEIS states: Increased potential for disposal and/or exchange of BLM-managed federal lands in [priority] and Greater Sage-Grouse habitat outside of [priority areas] could possibly result in expanded economic opportunities in the affected location… Possible land uses include use for county and municipal physical facilities, commercial or residential development, and/or recreation use.68 These uses are all identified as threats to sage-grouse habitat in the 2013 Conservation Objectives Team (COT) Report, which developed range-wide conservation objectives for sage-grouse that define the degree to which threats needed to be reduced or ameliorated to ensure that the species was no longer in danger of an ESA listing. 69 It can be difficult under the standards proposed by BLM to determine if land disposal "will compromise" sage-grouse persistence, or have "no direct or indirect impact" on populations.70 Retaining habitat in federal ownership helps ensure the land will be managed as prescribed in the BLM land use plans, providing certainty. It also will promote connectivity of sage-grouse populations.71 States have not committed to all the same management and approaches as BLM. Moreover, in some cases, such as for state trust lands, they are required to manage the lands to maximize revenues, which is likely inconsistent with conserving sage-grouse habitat. If there is a need to correct lands designated as sage-grouse habitat, we prefer it be accomplished through authorized habitat management boundary adjustments as provided for in the 2018 DEISs, consistent with our recommendations for how that process should be conducted. We also support the continued inclusion of provisions in the BLM plans that encourage acquisition of habitat where it will benefit sage-grouse populations.

C.3.13 Lek Buffers

Prescribed buffer distances (both those limiting activities and those setting out areas for analyzing and addressing impacts) must be maintained to guide analysis of impacts and limit harm to habitat.

BLM and USFS may approve actions in PHMAs that are within the applicable lek buffer distance identified above only if the BLM or USFS determine that a buffer distance other than the distance identified above offers the same or greater level of protection to sage-grouse and its habitat. The BLM or USFS will make this determination based on best available science... For actions in GHMAs, the BLM and USFS will apply the lek buffer distances in Table 3 as required conservation measures to fully address any impacts to sage-grouse identified during the project-specific NEPA analysis. However, if it is not possible to locate or relocate the project outside of the applicable lek buffer distance(s) identified above, the BLM or USFS may approve the project only if: (1) Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, State regulations), the BLM or USFS determine that a lek buffer distance other than the applicable distance identified above offers the same or a greater level of protection to sage-grouse and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or (2) the BLM or USFS determines that impacts to sage-grouse and its habitat are minimized such that the project will cause minor or no new disturbance (e.g., co-location with existing authorizations); and (3) any residual impacts within the lek buffer distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (see below). By applying lek buffers in addition to other measures, the Federal Plans provide an additional layer of protection to the habitat in closest proximity to leks and the areas documented in the literature to be the most important for breeding and nest success.100

If BLM is to move forward with eliminating the 1-mile leasing closure around sage grouse lek sites in favor of a No Surface Occupancy (NSO) stipulation, then it must be done in a manner that provides certainty for conservation outcomes. The draft plan provides opportunities for oil and gas operators to seek waivers, modifications, or exceptions (WME) for both the new NSO stipulation within 1-mile of a lek and new criteria for WMEs in priority habitat beyond that distance. Given the fact that the criteria for both stipulations is heavily predicated upon consultation with Colorado Parks and Wildlife and compensatory mitigation, then BLM must commit to requiring compensatory mitigation while also still adhering to the mitigation hierarchy, which prioritizes avoiding and minimizing impacts prior to mitigating.

On average, lek attendance was stable when no oil and gas development was present within 6,400m. However, attendance declined as development increased.4 For nesting habitat Zabihi et al. (2017) likewise found that avoidance of wellpads and access roads were the two most important factors predicting nest site selection. Importantly, Green et al. confirmed that declines in sage-grouse populations may continue even within Wyoming's "core areas," where density of wells is limited to approximately one pad per square mile. In addition, Kirol et a. (2015b) found that increases on coalbed methane wastewater ponds were correlated with decreased nest success in the Powder River Basin of Wyoming. To rectify these problems, BLM should impose, as terms of the Resource Management Plan, Conditions of Approval on all existing fluid mineral leases consistent with the recommendations of the Sage-Grouse National Technical Team, including no new surface occupancy on existing federal leases (with exceptions for occupancy of no more than 3% outside a 4-mile lek buffer, if the entire leasehold is within such habitat).

To develop relevant and practical lek buffer distances for the BLM plans, DOI commissioned the U.S. Geological Survey to review the scientific information on conservation buffer distances for sage-grouse. The resulting study101 recommended there be 5 km (3.1 miles) between leks and infrastructure related to energy development.102 It is important to stress that this distance does not result in 100%

protection for sage-grouse: [T]he minimum distance inferred here (5 km [3.1 miles]) from leks may be insufficient to protect nesting and other seasonal habitats. Based on the collective information reviewed for this study, conservation practices that address habitats falling within the interpreted distances may be expected to protect as much as 75 percent to 95 percent of local population's habitat utilization.103 A recent Wyoming study suggests that current regulations may only be sufficient for limiting population declines but not for reversing these trends. That study also noted that areas not protected under the 100 Wyoming plans are not subject to core area regulations and may experience larger increases in oil and gas development and, therefore, larger declines in sage-grouse populations.104 Other scientific input continues to stress the importance of buffers: ? 2016 Dahlgren study (UT): This study assesses distances between seasonal habitats to recommend buffer zones for conservation. Females and their broods from larger populations in contiguous sagebrush moved more than those in smaller, isolated populations, but small populations moved farther from leks to winter grounds. Distances from nests to leks were consistent with other research, but nest success slightly increased with distance from leks. Seasonal movements of Utah GRSG were generally lower than reported rangewide, likely because of fragmented sagebrush habitats. Management actions that increase the area of usable sagebrush may benefit Utah GRSG. Management plans can incorporate buffers based on, for example, observed distances between nests and leks to increase the conservation value of management actions. The authors recommended buffers of 5 and 8 kilometers between disturbed areas and GRSG breeding and summer habitats, respectively.105 ? 2018 Holloran Letter (importance of 2015 protections): Recommending management approaches and objectives established in 2015 BLM sage-grouse land use plans be used as minimum standards in sagebrush habitat.106 BLM's argument in support of the changes in Idaho, despite its acknowledgment that infrastructure and development would be allowed much closer to leks, is that there is very new development of infrastructure in Idaho in either priority or important habitat.107 If that is the case, then there is no real need for the proposed change. BLM also asserts that disturbance from development is not the major threat to sage-grouse in Idaho. While that is true, it is still a threat, one that buffers are designed to avoid. The Utah and Nevada DEISs argue that the 2014 USGS Report acknowledges that because of differences in populations, habitats and other factors, there is no single buffer distance that is appropriate for all sagegrouse populations and habitats across the range, and that buffers are just one of a number of protections for sage-grouse.108 The USGS Report acknowledges these points, and states that it attempted to take this variability into account in determining proper buffer distances, and notes that some studies have supported an 8 km buffer.109 As a result, USGS thus ended up with a compromise standard that protects most, but not all, habitat. Given that FWS explicitly relied on buffers as one of the protections that allowed it to avoid listing sage-grouse, it would be a mistake to reduce these standards or vest greater discretion with the states to allow reductions.

X. BUFFERS AROUND LEKS SHOULD BE MAINTAINED. The Idaho DEIS proposes to weaken buffers around leks in important habitat management areas, and to eliminate them in general habitat. They also grant additional discretion to decrease or increase buffers generally.96 Other DEISs also increase the degree of discretion afforded to decrease or increase97 buffers.98 Still other DEIS propose to provide "clarification" for lek buffers without stating what form that clarification would take.99 We oppose any changes that would weaken the standard for buffers in the 2015 Sage-grouse Plans. The decision by the FWS not to list sage-grouse under the ESA noted the importance of buffers to sagegrouse protection, and their role in the decision not to list: Sage-grouse leks are communal breeding centers that are representative of the breeding and nesting habitats. Conservation of these areas is crucial to maintaining sage-grouse populations.

C.3.14 Mitigation

Overall, the plans must explicitly commit to maintaining the FWS "not warranted" decision. The purpose and need of the 2018 amendments to seek better cooperation with states by modifying the management approach in the plans must be reconciled and made consistent with the purpose and need of the 2015 Sage-grouse Plans to conserve, enhance, and restore sage-grouse habitat by eliminating or minimizing threats to their habitat identified in the FWS 2010 finding that listing under the ESA was warranted. Without ongoing conservation, enhancement and restoration of habitat, the already impacted habitat and risks of further harm that led to the FWS 2010 finding will not be sufficiently addressed in these plans to maintain the FWS 2015 finding that listing is no longer warranted.

Mitigation must be applied through the mitigation hierarchy (avoid, minimize, then compensate) and, at a minimum, apply a "no net loss" standard so that while a range of multiple uses continue, their impacts are addressed. Avoidance should include avoiding locating rights-of-ways in habitat. Mitigation programs must incorporate a set of recognized principles related to mitigation, and continue to provide for application of compensatory mitigation at greater than 1:1 ratios, where necessary to address factors such as the full suite of harms and the uncertainty of success for specific mitigation measures, including where state programs provide for such approaches. The 2015 Sagegrouse Plans were premised on the understanding that ongoing activities in habitat would result in ongoing damage to habitat, so that opportunities to enhance and expand habitat must be provided in order for the species to ultimately survive.

Mitigation is a well-established tool that was relied upon in the 2015 Fish and Wildlife Service decision to support the decision to not list the Greater Sage-Grouse as threatened or endangered under the Endangered Species Act. The practice of "mitigation" is based on two common-sense principles: (1) certain activities are more appropriate in some locations than others; and (2) we should clean up after ourselves as we conduct activities that damage the landscape. The simplest definition of mitigation is "the action of reducing the severity, seriousness, or painfulness of something." Mitigation "done right" involves smart planning, efficient and effective decision-making, and predictability for project proponents, as well as a multitude of other stakeholder interests, and can result in positive outcomes for all - the public, communities, businesses, and the environment. The widely accepted mitigation hierarchy is a step-wise framework for evaluating proposed impacts that first acknowledges that the best way to address impacts from development on the most important habitat is to avoid those impacts in the first place. Some places are just too important to develop, or measures to minimize and/or compensate impacts may not be available or effective. Consider the wintering areas for sage-grouse. Several recent studies have confirmed the importance of ensuring conservation of sufficient amounts of these habitats.112 The next step in the hierarchy is to minimize impacts. A project developer should employ a wide range of actions to avoid as much disturbance as possible to wildlife in the area. For example, markers work to prevent fence-related mortality or injury that can occur when sage-grouse fly low to the ground over sagebrush range.113 If unavoidable impacts occur, the third and final step in the mitigation hierarchy is to compensate for the loss by creating, restoring, enhancing, or preserving habitat elsewhere. This might involve securing a conservation easement on private land or restoring nearby habitat with treatments designed to improve conditions for the affected species overall. Compensatory mitigation for a new road system or transmission line in sagebrush habitat could involve, for example, payments by the developer to reconvert farmland in central Montana that have pushed out sage species' preferred cover back to native sagebrush habitat. Thus, in its most basic sense, mitigation policy is truly about good governance. Sound mitigation policy provides agencies such as BLM with a structured,

rational, and transparent framework for reviewing use requests and meeting their multiple use and sustained yield mandates. When agencies frontload their planning and provide the public and applicants with information in advance about where development should and should not go, they are empowered to make faster, better decisions. Potential conflicts between conservation and development are reduced when developers know in advance what areas should be avoided. Good mitigation policy and practice is also one of the best opportunities to achieve sustainable development and conservation goals. Projects, even those with relatively small footprints, can pose significant impacts to migratory wildlife. Avoidance of the most important places offers the best way to support a Western landscape where species can thrive. Where impacts cannot be avoided or minimized, well-designed compensatory mitigation programs can achieve the multiple-use, sustained yield objectives of BLM and other federal agencies.

Additional authority also exists for the use of the mitigation hierarchy in issuing project-specific authorizations. For example, project-specific authorizations must be "in accordance with the land use plans,"135so if the land use plans adopt the mitigation hierarchy or other mitigation principles for the sage grouse under the various authorities described above, the project authorization must follow those principles. Moreover, in issuing project-specific authorizations, BLM may attach "such terms and conditions" as are consistent with FLPMA and other applicable law.136This general authority also confers broad discretion on BLM to impose mitigation requirements on project applicants, including compensatory mitigation in appropriate circumstances.137 Finally, as a distinct authority, BLM also has the obligation to ensure that project-specific authorizations do not result in "undue or unnecessary degradation. FLPMA states that BLM "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands."138A number of cases have found that BLM met its obligation to prevent unnecessary or undue degradation based, in part, on its imposition of compensatory mitigation. See e.g., Theodore Roosevelt Conservation Partnership v. Salazar, 616 F.3d 497, 518 (D.C. Cir. 2010) (BLM decision to authorize up to 4,399 natural gas wells from 600 drilling pads did not result in "unnecessary or undue degradation" in light of substantial mitigation required from permittees, including prohibition of new development outside core area until comparable acreage in the core was restored to functional habitat, and a monitoring and mitigation fund of up to $36 million); see also Gardner v. United States Bureau of Land Management, 638 F.3d 1217, 1222 (9thCir. 2011) (FLPMA provides BLM "with a great deal of discretion in deciding how to achieve the objectives" of preventing "unnecessary or undue degradation of public lands.")

As noted above, there has been a great deal of concern surrounding the BLM's authority to apply a net conservation benefit standard for sage grouse. Regardless of the standard employed, it is most important that there be a high level of certainty that direct, indirect, and cumulative impacts of infrastructure development will be offset with high quality, durable, timely, and additional compensatory mitigation projects. High quality compensatory mitigation projects are guided by mitigation programs that appropriately account for the magnitude, extent and duration of impacts, characterize the benefits of compensatory mitigation projects, and ensure that compensatory mitigation projects are durable. We support compensatory mitigation programs that seek to achieve a "reasonable relationship" between impacts and compensatory mitigation and adequately account for habitat quality, temporal losses, and risk of project failure. The 2016 Work Group Mitigation Report states that for compensatory mitigation programs to adequately address residual impacts, they should "provide habitat values, services and functions that bear a reasonable relationship to the lost values, service and functions for which mitigation is required".148 There are large variations in the quality of habitat for sage-grouse, and a significant likelihood of failure of restoration of habitat due to catastrophic fire events and the current

low success rates of restoration.149Recognizing these issues, most state sage-grouse mitigation programs, such as Nevada, address the variation in habitat quality by including measures of habitat functionality and using adjustment factors to account for the risk of failure and temporal loss. If habitat functionality is considered, state agencies can use a ratio-based estimate, adjusted to include consideration of factors such as likelihood of success and temporal loss of functions. Compensatory mitigation programs need not rely upon overly complicated measures - they must be defensible but need not be overly precise.

BLM has ample authority to apply the full mitigation hierarchy in the sage-grouse plans. FLPMA directs that public lands to be managed in a manner to ensure the protection of ecological and environmental values, preservation and protection of certain public lands in their natural condition, and provision of food and habitat for wildlife.120 This direction guides every significant aspect of the management of public lands under FLPMA, including the development of land management plans,121 project-specific authorizations for the use, occupancy, development of public lands,122 the granting of rights of way on public lands,123 and the promulgation of regulations to implement each of these authorities.124 While FLPMA does not elevate certain uses over others, it does delegate discretion to the BLM to determine whether and how to develop or conserve resources, including whether to require enhancement of resources and values through means such as compensatory mitigation.125 In sum, these statutory policies encompass the protection of environmental and ecological values on the public lands and the provision of food and habitat for fish and wildlife and are furthered by the implementation of the mitigation hierarchy, including compensatory mitigation, to protect and preserve habitat for the sage grouse.

Beside the principles of FLPMA and its multiple use/sustained yield standards, individual provisions of that Act confer additional authority on BLM to apply the mitigation hierarchy. In the section on land use plans, for example, FLPMA obliges BLM to consider environmental values, such as fish and wildlife like the sage grouse, in the development of such plans.133More particularly, BLM must also "consider the relative scarcity of the values involved and the availability of alternative means…and sites for realization of those values".134 Sage-grouse habitat is a wildlife value with relative scarcity, as evidenced by the Fish and Wildlife Service's consideration of the species for listing under the ESA, its designation as a special status species by BLM, and its active management by numerous Western states. In the process of developing land use plans which account for this important and relatively scarce species, BLM can provide for the use of "alternative sites" in appropriate instances, thereby resulting in avoidance. Similarly, BLM can specify "alternative means," which can include minimization as well as compensatory mitigation under appropriate circumstances. In short, resources designated as "special" by BLM should be managed through a resource goal that may necessitate compensatory mitigation actions, as appropriate.

BLM has the authority to incorporate, implement, and enforce state sage-grouse mitigation programs that meet a recognized set of principles. The 2015 Records of Decision for Greater sage-grouse included a commitment to develop compensatory mitigation strategies in each sage-grouse management zone.142 As the 2015 land use plans were completed and implementation efforts began, however, several states had already completed or had begun efforts to develop compensatory mitigation strategies to implement GRSG conservation measures on state and private lands. It thus became apparent that developing federal mitigation strategies for each management zone would be redundant and could, in fact, create conflicts between state and federal mitigation strategies. This recognition led to the

establishment of the Greater Sage-Grouse Mitigation Work Group (2016 Work Group Mitigation Report), and its charge to identify key principles for compensatory mitigation strategies as well as mechanisms to support and institutionalize collaborative state and federal GRSG mitigation efforts.143 The 2018 DEISs state that the purpose of the Work Group was "to enhance cooperation with the states by modifying the approach to Greater Sage-Grouse management in existing land use plans to better align with individual state plans and/or conservation measures and DOI and BLM policy."144 The DEISs also state that, "The BLM will work to be consistent with or complementary to the management actions in [state] plans whenever possible."145 Given BLM's broad authority to adopt and impose mitigation to protect sage-grouse, at a minimum, BLM certainly can act to adopt, implement and enforce the state mitigation programs for use on federal land. In doing so, it is critical to ensure that the state mitigation programs employed by BLM follow commonly recognized principles, such as those laid out by The Nature Conservancy in its 2015 report, Achieving Conservation and Development: Applying the Mitigation Hierarchy (2015 TNC Report).146 These principles include: application of the mitigation hierarchy in a landscape context; policy goals that support conservation and drive accountability; inclusion of stakeholder engagement practices; long-term, durable options; additionality, equivalence, and protection against temporal losses.147 We support efforts of the states to experiment with different mitigation approaches, if their programs and those of the Department, meet the defined principles. The fact that the state programs differ from each other is not necessarily a concern; in fact, variation can often result in good management outcomes, enabling programs to be tailored to the needs of each state, as well as allowing states to experiment and determine which approaches are most effective. We thus support the Department providing minimum principles, consistent with the 2015 TNC Report, that all state programs must meet, and allowing states to exceed those principles if they choose to do so.

FLPMA also directs the Secretary to "manage the public lands under principles of multiple use and sustained yield".126The principles of multiple use and sustained yield pervade and underpin each of BLM's authorities under FLPMA, including the policies governing the Act,127the development of land use plans,128the authorization of specific projects,129and the granting of rights of way.130Multiple use means, among other things: the management of public lands…so that they are utilized in the combinations that will best meet the present and future needs of the American people; … a combination of balanced and diverse resource uses that takes into account the long term needs of future generations for renewable and nonrenewable resources, including…range, … watershed, wildlife and fish…; and harmonious and coordinated management of the various resources without permanent impairment of…the quality of the environment...131 Sustained yield means "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the public lands".132 Sage-grouse is certainly one of the wildlife resources to be protected under the multiple use standard, and it is a resource whose annual and periodic output is to be achieved and maintained in perpetuity under the sustained yield standard. To protect the present and long-term use of the public land for "fish and wildlife" "without impairment of the quality of the environment," BLM has the authority to apply the mitigation hierarchy for sage grouse, including compensatory mitigation in appropriate circumstances. Thus, BLM has additional, clear authority to use the mitigation hierarchy in its land use plans for the protection of the sage-grouse and its habitat. Case law confirms that multiple use/sustained yield principles do "not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required." New Mexico ex rel. Richardson v. BLM, 565 F.3d 683, 710 (10thCir. 2009). The mitigation hierarchy, including compensatory mitigation, provides an important tool for achieving a balance among the multiple uses allowed on public lands. BLM can authorize a consumptive use, like oil and gas development, but balance that use by providing compensatory

mitigation for the unavoidable losses suffered by the fish and wildlife. In other words, the mitigation hierarchy can have the effect of expediting and defending authorized consumptive uses of the public lands while simultaneously protecting fish and wildlife resource values in perpetuity.

Good mitigation policy and practice is also one of the best opportunities to achieve sustainable development and conservation goals. Projects, even those with relatively small footprints, can pose significant impacts to migratory wildlife. Avoidance of the most important places offers the best way to support a Western landscape where species can thrive. Where impacts cannot be avoided or minimized, well-designed compensatory mitigation programs can achieve the multiple-use, sustained yield objectives of BLM and other federal agencies. Governments, businesses, and local communities are increasingly acting to improve mitigation policy and practice. This is shown by the following: ? 56 countries have or are developing national mitigation policies that require offsets or enable the use of offsets, with most of these policies developed over the past decade. ? Multi-lateral and private sector financial institutions are requiring projects they finance to avoid, minimize, and compensate for biodiversity impacts in accordance with new performance standards. This includes requirements for project developers to avoid impacts to "critical habitat." ? A 2015 analysis of the economic contribution of mitigation determined that the domestic ecological restoration sector directly employs approximately 126,000 workers nationwide and generates $9.5 billion in economic output (sales) annually, with an additional 95,000 jobs and $15 billion in economic output through indirect (business-to business) linkages and increased household spending.

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In 2015, in its ESA listing decision, the Fish and Wildlife Service (FWS) found that "the greater sage-grouse is not in danger of extinction now or in the foreseeable future throughout all or a significant portion of its range and that listing the species is no longer warranted." The Service's finding was based not on the stability of the species' population, but rather on the "adequacy of regulatory mechanisms and conservation efforts".114Mitigation - avoidance, minimization and, where appropriate, compensatory mitigation - was an essential regulatory and conservation tool that supported this decision. Specifically, the FWS stated: All of the Federal Plans require that impacts to sage-grouse habitats are mitigated and that compensatory mitigation provides a net conservation gain to the species. All mitigation will be achieved by avoiding, minimizing, and compensating for impacts following the regulations from the White House Council on Environmental Quality (e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM/USFS management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e., residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to

that which would have resulted without the compensatory mitigation.115 The decision outlines the efforts states have made to utilize regulatory mechanisms to address threats to the species, noting that the Wyoming state program "features development stipulations to guide and regulate development within the Core Population Areas to avoid as much as possible, but, if avoidance is not possible, to minimize and mitigate, impacts to sage-grouse and its habitat."116The Service then concluded, "Requiring mitigation for residual impacts provides additional certainty that, while impacts will continue at reduced levels on Federal lands, those impacts will be offset".117 Each of the seven states with significant sage-grouse populations has by now either completed or is working on establishing a mitigation program for sage-grouse. Barrick Gold and the Department of the Interior have also signed a separate agreement to create the Barrick Nevada Sage-Grouse Bank in northern Nevada, creating incentives for Barrick to voluntarily protect, restore and enhance sagebrush ecosystems for the benefit of sage-grouse, while allowing the company to conduct mining activities on other BLM land.118 Last August, the Department of the Interior (DOI) Sage-Grouse Review Team Report, commissioned by Secretary Zinke, concluded that state and federal mitigation programs were an important and critical tool to preclude an ESA listing, noting that both DOI and the states agree on this point. 119The 2015 BLM sage-grouse plans not only employ the mitigation hierarchy as a regulatory and conservation tool to preclude listing, but the listing decision is, in part, also based on the promise of the protections and conservation measures that implementation would deliver.

In addition, BLM should have the policy prescriptions and tools available to allow for compensatory mitigation on public lands to offset private or public activities. Impacts to key sage-grouse habitat located on private land, particularly in states such as Nevada, often necessitate the need for compensatory mitigation on public lands, given the limited availability of private land for use as offsets. Maintaining this capability will be critical to conservation success. Last, but far from least, providing agency field staff with training is an important mechanism to accelerate permitting and project review. By committing resources to training field staff, BLM could increase the technical capacity of local staff to implement mitigation policies effectively and do so consistently across field offices. Providing clear direction to project proponents on how the agencies will make avoidance, minimization and compensatory mitigation decisions can help streamline project review and accelerate project approval.

In doing so, it is critical to ensure that the state mitigation programs employed by BLM follow commonly recognized principles, such as those laid out by The Nature Conservancy in its 2015 report, Achieving Conservation and Development: Applying the Mitigation Hierarchy (2015 TNC Report).146These principles include: application of the mitigation hierarchy in a landscape context; policy goals that support conservation and drive accountability; inclusion of stakeholder engagement practices; long-term, durable options; additionality, equivalence, and protection against temporal losses.147 We support efforts of the states to experiment with different mitigation approaches, if their programs and those of the Department, meet the defined principles. The fact that the state programs differ from each other is not necessarily a concern; in fact, variation can often result in good management outcomes, enabling programs to be tailored to the needs of each state, as well as allowing states to experiment and determine which approaches are most effective. We thus support the Department providing minimum principles, consistent with the 2015 TNC Report, that all state programs must meet, and allowing states to exceed those principles if they choose to do so.

It has recently been argued by several states that BLM may only use compensatory mitigation to prevent "unnecessary or undue degradation". Under this view, where the impacts of a proposed activity have not

been demonstrated to rise to the level of "unnecessary or undue degradation," any authorization of that activity which requires either net benefit or no net loss for the actual impacts would violate FLPMA. The unnecessary or undue degradation standard, however, is just a minimum standard for BLM's land management policy; it does not restrain BLM's discretion to adopt or require mitigation in circumstances that do not rise to the level of "undue or unnecessary degradation" or to implement a higher mitigation standard. As explained above, BLM has numerous authorities supporting its use of mitigation more generally, including the policies and principles underlying FLPMA, the foundational multiple use, sustained yield standard, the authority to promulgate regulations, and the specific authorities applicable to land use plans and project-specific authorizations. This point was confirmed in Western Exploration, LLC v. U.S. Department of the Interior.139In considering the argument that a net conservation gain standard for compensatory mitigation violated FLPMA, the court stated: The FEIS states that if actions by third parties result in habitat loss and degradation, even after applying avoidance and minimization measures, then compensatory mitigation projects will be used to provide a net conservation gain to the sage-grouse. The Agencies' goals to enhance, conserve, and restore sage-grouse habitat and to increase the abundance and distribution of the species, they argue, is best met by the net conservation gain strategy because it permits disturbances so long as habitat loss is both mitigated and counteracted through restorative projects. If anything, this strategy demonstrates that the Agencies allow some degradation to public land to occur for multiple use purposes, but that degradation caused to sage-grouse habitat on that land be counteracted. The Court fails to see how BLM's decision to implement this standard is arbitrary and capricious. Moreover, the Court cannot find that BLM did not consider all relevant factors in choosing this strategy… In sum, Plaintiffs fail to establish that BLM's challenged decisions under FLPMA are arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.140 Both FLPMA and the case law thus establish that BLM has ample discretion to go beyond the prevention of unnecessary or undue degradation to seek compensatory mitigation that will meet "the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, . . . wildlife and . . . natural scenic, scientific and historical values."141None of these authorities distinguish between avoidance, minimization, and compensatory mitigation or prohibit or circumscribe compensatory mitigation; rather, the authorities are broad and support the use of each aspect of mitigation in appropriate circumstances. BLM's obligations, discretion and authority are particularly important in coordinating with states, especially where states lack ownership or authority to carry out needed mitigation.

XI. MITIGATION IS AN IMPORTANT PART OF FEDERAL AND STATE EFFORTS, AND MUST BE MAINTAINED. Each of the DEISs contains similar language requesting comments on how the Bureau of Land Management (BLM) should consider and implement sage-grouse mitigation: The DOI and the BLM have also modified their mitigation policies since the 2015 plans were finalized. The public did not have the opportunity to comment specifically on a net conservation gain approach to compensatory mitigation during the 2015 land use planning process. In addition, the DOI and the BLM are evaluating whether the implementation of a compensatory mitigation standard on public lands is appropriate and consistent with applicable legal authorities. We request public comment about how the BLM should consider and implement mitigation with respect to the Greater Sage-Grouse, including alternative approaches to requiring compensatory mitigation in BLM land use plans.110 For some states, such as Idaho, Utah, and Wyoming, the DEIS also removed the requirement of a net conservation gain standard for their mitigation programs.111 Overall: 1. Mitigation (avoidance, minimization, and compensation) as adopted in the 2015 BLM land use plans is an effective and well-established tool that the Fish and Wildlife Service relied upon to support its decision not to list the Greater Sage-Grouse as threatened or

endangered under the ESA. Sound mitigation policy provides agencies such as BLM with a structured, rational, and transparent framework for reviewing use requests and meeting their multiple use and sustained yield mandates. The 2015 BLM sage-grouse plans employed the mitigation hierarchy to help reach their goal of protecting sage-grouse while also allowing multiple uses to proceed by ensuring that associated impacts to habitat are fully offset. 2. BLM has ample authority to apply the full mitigation hierarchy in the sage-grouse plans. Both FLPMA and case law provide BLM the discretion to seek compensatory mitigation to protect sage-grouse. 3. BLM has the authority to incorporate, implement, and enforce state sage-grouse mitigation programs that meet a recognized set of principles. We recommend that these principles should be consistent with those laid out by The Nature Conservancy in its 2015 report, Achieving Conservation and Development: Applying the Mitigation Hierarchy. In addition, we support compensatory mitigation programs that seek to achieve a "reasonable relationship" between impacts and compensatory mitigation and adequately account for habitat quality, temporal losses, and risk of project failure. The amount and type of compensatory mitigation should be proportional to, and have a reasonable relationship to, direct and indirect impacts.

C.3.15 Modifying Waivers, Exceptions, and Modifications of Fluid Minerals

As an example, the general approach conditions included in the Draft Colorado RMP Amendment related to no surface occupancy stipulations are more specific and include public engagement. * Waivers are permitted if the area lacks "protected attributes" - as determined through coordination with Colorado Parks and Wildlife and following a 30-day public notice/comment period * Modifications and exceptions are permitted if: (1) impacts are fully offset by compensatory mitigation; or (2) no impacts to greater sage-grouse would occur because of terrain or habitat type - but can only be applied after consultation with Colorado Parks and Wildlife. CO Draft RMP Amendment/EIS, pp. 2-4 - 2-5. Overall, one-time exceptions should be the preferred approach where relief is sought from protective stipulations, such that the safeguards prescribed in these stipulations will remain in place for the majority of oil and gas leases. Waivers, exceptions and modifications should only be granted from no surface occupancy (NSO) stipulations or any stipulations in PHMA after a 30-day public notice and comment period. Further, the U.S. Fish and Wildlife Service should have the opportunity to submit information for consideration prior to granting waivers, exceptions and modifications. Finally, it is critical that BLM track waivers, exceptions and modifications requested and those granted, and make that information available to the public. These records will provide important insight into how the stipulations are being applied and the potential impact of waivers, exceptions and modifications on the overall function of the plans. This information will also allow BLM to determine if the availability of or criteria for granting waivers, exceptions and modifications needs to be further narrowed in order to ensure sufficient protection for sage-grouse habitat. Accordingly, we recommend that each plan include language that provides: Exceptions will be considered prior to considering waivers or modifications. If the BLM determines that a waiver or modification is more appropriate, the reasons for such decisions will be documented. Waivers are permitted if the area lacks "protected attributes" - as determined through coordination with the appropriate state wildlife agency. Modifications and exceptions are permitted if: (1) impacts are fully and verifiably offset by compensatory mitigation; or (2) there are no impacts to greater sage-grouse because of terrain or habitat type, based on consultation with the applicable state wildlife agency. Prior to granting any waivers, exceptions and modifications, BLM will insure that the U.S. Fish and Wildlife Service has the opportunity to submit information for consideration. For no surface occupancy stipulations or stipulations in Priority Habitat Management Areas, waivers exceptions and modifications will only be granted following a 30-day public notice and comment period. BLM will maintain an ongoing

record of requests for waivers, exceptions and modifications and whether those requests are granted, and will publish those cumulative results on a quarterly basis.

V. RECOMMENDED APPROACH TO WAIVERS, EXCEPTIONS AND MODIFICATION TO OIL AND GAS LEASE STIPULATIONS. The 2015 Sage-grouse Plans include numerous oil and gas lease stipulations that apply to development in order to protect sage-grouse and sage-grouse habitat, including no surface occupancy stipulations, timing limitations and surface use limitations. The draft amendments and EISs also rely on lease stipulations. However, the protections actually provided by the stipulations are only reliable and effective to the extent that the safeguards are applied. Waivers (permanent exemption that applies to the entire leasehold), exceptions (one-time exemption for a particular site within the leasehold) and modifications (change to the lease stipulation, either temporarily or for the term of the lease, can apply to the entire leasehold or certain areas) all permit an operator to avoid compliance with the requirements of a stipulation. Where these loopholes are permitted and used, the protections that the stipulations are supposed to provide can be undermined. Recent studies confirm that oil and gas development can harm both sage-grouse habitat and lifecycle activities, such as breeding.46 Consequently, it is vital that protections associated with oil and gas development are reliably applied and, as a result, that waivers, exceptions and modifications are not broadly used to weaken those protections. While we can accept narrowly prescribed waivers, exceptions and modifications to lease stipulations that are based on very specific criteria, broad standards, such as those currently included in the Nevada Draft RMP Amendment/EIS are not acceptable.

C.3.16 Noise Management Outside of PHMA

Comment: 2 Document: CH 3 - Affected Environment 3.11 Noise 3.11.5 Page Number: 3-95 Line Number: 14 Local studies conducted for the PAPA found existing ambient sound levels (L50) at four locations throughout the Upper Green River area for hours important to greater sage-grouse lek behavior (1800-0800) were 19.9 dBA, 14.8 dBA, 14.3 dBA, and 14.5 dBA. The median L50 for all 1800-0800 hours at all sites was 15.4 dBA.

Comment: 5 Document: CH 3 - Affected Environment 3.11 Noise 3.11.5.3 Page Number: 3-97 Line Number: 1-16 The discussion including the BLM Wyoming sage-Grouse RMP Amendments should include Appendix C, Required Design Features identifying ambient measures as 20-24 dBA at sunrise at the perimeter of a lek during active lek season.

Comment: 7 Document: CH 2 -Alternatives 2.4.3 Greater Sagegrouse habitat management Page Number: 2-8 Line Number: 25-27 Noise protocols for Wyoming have been developed and should be required (Ambrose and MacDonald 2015. Review of sound level measurements in Wyoming relative to greater sage grouse and recommended protocol for future measurements) Management of noise should include but not be limited to, timing restrictions during lekking, nesting and brood rearing season, and design features that include; siting facilities outside of grouse priority habitat or placed to take advantage of topography, application of sound blankets and or sound walls, use of mufflers, and reducing traffic noise through controlled traffic patterns and restricting travel hours to between 8 am and 6 pm within 2 miles of the perimeter of a lek.

Comment:3 Document: CH 3 - Affected Environment 3.11 Noise 3.11.5.2 PAge Number: 3-95 Line Number: 27 We are concerned for the validity of the noise data provided for this project as the microphone height was reported as being 2.43 meters (8 feet) above the ground. Protocols for noise

monitoring were established for the Pinedale Field Office, Pinedale Anticline Project Area which requires a microphone height of 0.3 m (1 foot) to address the influence of wind on sound measurement.

Comment:4 Document: CH 3 - Affected Environment 3.11 Noise 3.11.5.2 Page Number: 3-96 Line Number:2-7 An evaluation of sound level studies was conducted for WGFD which looked at noise data collected throughout Wyoming (Ambrose, S. and J. MacDonald, 2015. Review of Sound Level Measurements in Wyoming Relative to Greater Sage-grouse and Recommended Protocol for Future Measurements.) The authors recommended microphones be placed 1 foot from the ground (0.30 m) to more accurately reflect sounds experienced by the bird. They also found wind to have a clear influence on dBA data and metrics; the higher the wind speed, the higher the dBA levels "As wind speed increased, dBA levels increased, regardless of microphone height; however, dBA levels at 1.5 m were significantly higher than dBA levels at 0.3 m (up to 8.7 dBA higher). What these data indicate is that at a microphone height of 0.3 m, the increase in dBA level was due to sounds of wind through vegetation. The report goes on to say, "Sounds due to wind are of two types: natural sounds, such as leaves rustling and the sound of wind through vegetation, and wind-induced equipment sounds, such as turbulence over the diaphragm of the microphone, wind hitting the foam wind screen, wind causing the microphone tripod to move, or wind sounds through cables securing the tripod. Wind-induced equipment sounds are not part of the acoustic environment, but rather an artifact of data collection. Such data should not be included in analysis. "We are concerned for the validity of the noise data provided for this project as the microphone height was reported as being 2.43 meters (8 feet) above the ground. Also, no monitoring data was excluded from the analysis even though three of the microphones were found tipped over due to wind. This would suggest the data is flawed as the influence of noise and equipment falling over are not legitimate sounds of the environment, but artifacts of wind-equipment interaction.

Comment:6 Document: CH 3 - Affected Environment 3.11 Noise 3.11.5.3 Page Number: 3-99 Line Number:1-8 Minimum L50 values reported for the monitoring sites were elevated due to the microphone height being at 8 feet from the ground and tipping over resulting in additive influence from wind. The single average L50 value of 25 dBA recommended to characterize the ambient noise level at the perimeter of lek location in the NPL Project EIS is flawed. By comparison, within the PAPA (an active gas field) the median L50 dBA for all hours at all leks for the years 2013-2015 was 26.0 dBA (range 17.5-36.9). Additionally, monitoring noise impacts in the PAPA has revealed lek declines for all leks exposed noise > 26 dBA from the perimeter of a lek.

Comment: 1 Document: CH 3 - Affected Environment 3.11 Noise Page Number: 3-89 through 3-99 This section proposes to evaluate existing sound levels within the proposed project area to adequately assess noise-related impacts from the proposed action. The data was collected in 2012 and likely does not represent sound levels found in the project area today. Six of the 10 leks within the proposed project area are showing declining trends without the addition of this project activity. This suggests there are already impacts to sage grouse from existing anthropogenic activities. Four of the leks showing declining trends are within a Core area for sage grouse This project evaluation drew comparisons f a study conducted in Lander WY. To adequately assess the noise-related impacts of the NPL Project, it would be appropriate to incorporate local baseline data. Such data was collected for the adjacent Pinedale Anticline Project Area (PAPA) and should be included in this project evaluation. Noise level data has been collected throughout the Upper Green River Valley since 2009. This information is available from published reports on the BLMPAPO web page (http://www.wy.blm.gov/jio-papo/). Instead the analysis drew comparisons only to a study conducted in Lander WY.

C.3.17 Preferred Alternative

Proposed Alternative to Maintain the "Not Warranted" Finding The 2015 Sage-grouse Plans were the basis for the U.S. Fish and Wildlife Service (FWS) finding that listing the greater sage-grouse under the Endangered Species Act (ESA) is no longer warranted. This decision was based on a determination that the plans provide sufficient certainty regarding their implementation and effectiveness and must not be threatened by this amendment process. The surest way to maintain the not warranted decision would be to maintain the current 2015 Sage-grouse Plans by adopting the "no action" alternative in this amendment process, which would still provide sufficient flexibility to adapt through implementation. However, recent instruction memoranda and policy changes (such as rescinding guidance on mitigation) that alter implementation of the 2015 plans are already undermining their effectiveness. The changes to the 2015 plans that are currently under review further jeopardize the structure and function of the plans and, as a result, risk the important protections that safeguard habitat and support FWS's not warranted finding. The collaborative work that went into creating the original plans should be honored. To the extent that DOI and BLM are committed to making some changes to the plans while also maintaining necessary protections to justify the Fish and Wildlife Service's finding, this proposed alternative highlights key elements to be incorporated in the plans, including maintaining current provisions and clarifying or improving others. This alternative is further supported by the 2018 U.S. Geological Survey report (https://doi.org/10.3133/ofr20181017), which found that research since 2015 reinforces the science underlying the structure and function of the 2015 Sage-grouse Plans. The following describes the key elements of our recommended alternative. Additional detail regarding implementation of the elements is available in technical comments.

The surest way to maintain the not warranted decision would be to maintain the current 2015 Sage-grouse Plans by adopting the "no action" alternative in this amendment process, which would still provide sufficient flexibility to adapt through implementation. However, recent instruction memoranda and policy changes (such as rescinding guidance on mitigation) that alter implementation of the 2015 plans are already undermining their effectiveness. The changes to the 2015 plans that are currently under review further jeopardize the structure and function of the plans and, as a result, risk the important protections that safeguard habitat and support FWS's not warranted finding. The collaborative work that went into creating the original plans should be honored. To the extent that DOI and BLM are committed to making some changes to the plans while also maintaining necessary protections to justify the Fish and Wildlife Service's finding, this proposed alternative highlights key elements to be incorporated in the plans, including maintaining current provisions and clarifying or improving others. This alternative is further supported by the 2018 U.S. Geological Survey report (https://doi.org/10.3133/ofr20181017), which found that research since 2015 reinforces the science underlying the structure and function of the 2015 Sage-grouse Plans.

C.3.18 Prioritization of Mineral Leasing

The requirement to prioritize oil and gas leasing and development outside of sage-grouse habitats must be maintained and clarified so that it is a meaningful tool to reduce habitat destruction and fragmentation. Prioritization should be based on analyzing factors such as the condition of habitat and oil and gas potential to make informed decisions about when the best approach would be to prioritize other proposed lease or permits, or even defer leasing or phase development in order to ensure habitat is protected.

In order to ensure adequate conservation of sage-grouse and sage-grouse habitat, prioritization of oil and gas leasing and development cannot be based solely on whether BLM has sufficient resources to process leasing nominations or applications for permits to drill in sage-grouse habitat. Rather, there must be a thorough consideration of opportunities to protect habitat. These opportunities include deferring proposed leasing that would unnecessarily harm habitat or where leasing is not the best use of agency resources (both internal resources and in terms of allocating our public lands), such as where there is low or no potential for leasing, high quality habitat and no surrounding infrastructure or development. BLM is not obligated to lease every parcel that is proposed nor is there a requirement that any deferral be replaced with another parcel to somehow maintain the same number of parcels or acres up for lease. See, e.g., New Mexico ex. rel. Richardson v. BLM, 565 F.3d 683, 710 (10th Cir. 2009) ("It is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses."). Rather, the agency can take into account relevant factors and the importance of conserving grouse habitat to meaningfully prioritize leasing where it is most appropriate and least harmful to sage-grouse habitat. The impact such factors could have on leasing decisions is demonstrated by the map below, which shows the distribution of proposed lease sale parcels for the December 2018 sale in sage-grouse habitat in the Kremmling (Colorado) Field Office: [SEE ATTACHMENT PG 28] Explicitly considering the value of habitat and the potential for actual energy production would unquestionably help the agency prioritize the right parcels for leasing.

RECOMMENDED APPROACH TO PRIORITIZING OIL AND GAS LEASING AND DEVELOPMENT OUTSIDE SAGE-GROUSE HABITAT. The 2015 Sage-grouse Plans are clear as to the need for prioritizing oil and gas leasing and drilling outside sage-grouse habitat and the desired effect of related actions. From the Rocky Mountain Record of Decision (p. 1-25): . . . the ARMPs and ARMPAs prioritize oil and gas leasing and development outside of identified PHMAs and GHMAs. This is to further limit future surface disturbance and encourage new development in areas that would not conflict with GRSG. This objective is intended to guide development to lower conflict areas and as such protect important habitat and reduce the time and cost associated with oil and gas leasing development by avoiding sensitive areas, reducing the complexity of environmental review and analysis of potential impacts on sensitive species, and decreasing the need for compensatory mitigation. The Rocky Mountain ROD also identifies prioritizing oil and gas leasing and development outside habitat as a "key component" and a "key management response" (pp. 1-18 - 1-19). The Buffalo Field Office ARMP/ROD (p. 50) and Wyoming 9-Plan ARMPA (p. 24) echo this directive, including the following objective: Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of Greater Sage-Grouse habitat. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in priority habitat (core population areas and core population connectivity corridors) and general habitat, and subject to applicable stipulations for the conservation of Greater Sage-Grouse, priority will be given to development in non-habitat areas first and then in the least suitable habitat for Greater Sage-Grouse. (emphasis added). The inter-agency, expert Conservation Objectives Team (COT) Report confirms the need to prioritize development outside habitat, finding that: Sage-grouse populations can be significantly reduced, and in some cases locally extirpated, by non-renewable energy development activities, even when mitigative measures are implemented (Walker et al. 2007). The persistent and increasing demand for energy resources is resulting in their continued development within sage-grouse range, and may cause further habitat fragmentation. . . . Both non-renewable and renewable energy developments are increasing within the range of sage-grouse, and this growth is likely to continue given current and projected demands for energy.44 As a result, the COT

Report recommended the following objective for energy development: "Energy development should be designed to ensure that it will not impinge upon stable or increasing sage-grouse population trends."45

Prioritization for Leasing BLM has used specific factors to guide prioritization of leasing outside sage-grouse habitat. For instance, in assessing the December 2017 lease sale for the Vernal Field Office (https://eplanning.blm.gov/epl-frontoffice/projects/nepa/80165/130450/158729/Final_Vernal_EA.pdf), BLM created a chart evaluating how certain prioritization considerations applied to parcels (existing lease, existing unit, field-EIS, high gas potential, high oil potential), completed site visits to confirm conditions on the ground, and then only included parcels in the lease sale that met the majority of the factors. We propose that the BLM use the following factors: * Intactness/quality of habitat - classification of habitat (i.e., priority, important, general); quality of habitat; importance for connectivity or seasonal habitat * Population trends in applicable zone or biologically significant unit * Distance from existing disturbance * Distance from existing infrastructure - roads, well pads, pipelines * Need for additional infrastructure - estimated surface disturbance * Adjacent to existing lease - yes/no/proximity * Within existing oil and gas unit * Within existing master leasing plan * Oil potential - none, low, moderate, high * Natural gas potential - none, low, moderate, high BLM will conduct site visits to confirm conclusions, as needed. Decisions to include nominated lease parcels in sage-grouse habitat in lease sales will be based on the following evaluation of factors: - Parcels that do not have moderate or high potential should not be offered. - Parcels that have high quality habitat, are not in proximity to existing disturbance and/or require additional infrastructure to be developed should not be offered. - Parcels that are in close proximity to existing disturbance and infrastructure, and are already within an existing oil and gas unit or master leasing plan that has been analyzed in an environmental impact statement may be considered for leasing. - Parcels outside priority habitat should be considered for leasing prior to parcels in PHMA. Prioritization in Development BLM will prioritize development outside sage-grouse habitat by considering the following factors: * Intactness/quality of habitat - classification of habitat (i.e., priority, important, general); quality of habitat; quality of habitat; importance for connectivity or season habitat * Population trends in applicable zone or biologically significant unit * Distance from a lek * Need for new infrastructure - estimated surface disturbance * Ability to use existing well pad and infrastructure * Oil potential - none, low, moderate, high * Natural gas potential - none, low, moderate, high These factors will apply to both exploratory and other types of development activities. BLM will conduct site visits to confirm conclusions, as needed. Decisions to approve applications for permits to drill in sage-grouse habitat will be based on the following evaluation of factors: - Where applications for permits to drill are in high quality/intact habitat, are not in proximity to existing disturbance and/or require additional infrastructure to be developed, they will not be prioritized and opportunities will be evaluated to relocate permits. - Where applications for permits to drill are not in areas with high or moderate potential, they will not be prioritized. - Where applications for permits to drill are able to use existing well pads and infrastructure and otherwise avoid surface disturbance and noise impacts to leks, they are more suitable for processing and approval. - Applications for permits to drill outside priority habitat should be considered for approval prior to parcels in PHMA.

Prioritization is also essential when it comes to the location of oil and gas leasing and development. BLM makes no mention of lease prioritization in the DEIS despite previous guidance regarding lease prioritization. Quite simply, it makes perfect sense to prioritize the leasing and development of oil and gas resources outside of priority and general habitat. Nearly 90% of Colorado's Greater sage grouse population is concentrated in Moffat and Jackson Counties. Without the highest quality habitat being

conserved, the risk of adversely impacting those populations is far too high and in turn, the likelihood of a future ESA listing grows, which no one wants to see happen.

C.3.19 Range of Alternatives

Alternatives are measured against purpose and need; BLM has not considered a reasonable range of alternatives in the Draft EIS based on the restated purpose and need. When developing an EIS, the "range of reasonable alternatives is measured against the 'Purpose and Need' section…." Cal. ex rel. Lockyer v. U.S. Dep't. of Agriculture, 459 F. Supp. 2d 874, 905 (N.D. Calif., 2006), aff'd, 2009 U.S. App. LEXIS 19219 (9th Cir. 2009). The statement of "purpose and need" is the basis upon "which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. §1502.13 and City of Carmel-by-the-Sea v. U.S. Dep't. of Transportation, 123 F.3d 1142, 1155 (9th Cir. 1997). Therefore, if the purpose and need of the 2018 Draft EIS for the Greater Sage-Grouse changes from the purpose and need for the 2015 EIS, then the range of alternatives must necessarily change as well. Even the 2018 Draft EIS recognizes that "BLM's purpose and need for this planning action helps define the scope of proposed alternative actions…" Nevada DEIS, p. ES-2. In Lockyer, the Forest Service argued that it could base its EIS for the new 2005 version of the "Roadless Rule" upon the EIS (and its alternatives) for 2001 Roadless Rule that it replaced. The court found: This argument fundamentally misconstrues the role of the consideration of reasonable alternatives, which lies at the heart of any NEPA analysis. Failure to consider reasonable alternatives thwarts the goals of informed decision making and meaningful public comment before the environmental die is cast. Lockyer at 905 (citations omitted). The Forest Service proposed the 2005 Roadless Rule as a means to give states more authority over designating roadless areas on federal land. In fact, the Forest Service called the 2005 rule the "State Petitions" rule. While the Forest Service argued the 2005 rule and the 2001 rule "share the same purpose and need," the Court concluded that their purposes were "plainly quite different" because the 2005 rule granted state-specific exemptions. Lockyer at 906. The 2018 Draft EISs are clear that their purpose and need is different from the 2015 EISs. Under the heading "Purpose of and Need for Action," the Draft EISs state that "The purpose of this RMPA/EIS is to enhance cooperation with the states by modifying the approach to Greater Sage-Grouse management in existing land use plans to better align with individual state plans and conservation measures and with DOI and BLM policy." See, e.g. Nevada DEIS, p. 1-3. Because the 2018 Draft EIS states a different purpose and need compared to the 2015 EIS, BLM, pursuant to Lockyer, must necessarily consider a new range of alternatives to meet that new purpose and need. Under Lockyer, BLM in 2018 cannot tier to alternatives considered for the different purpose and need of the 2015 EIS.

The No-Action Alternative in the Draft EIS is the baseline, not a real alternative. The 2018 Draft EISs for the Greater Sage-Grouse purport to compare two alternatives - the "No Action Alternative" versus the "Management Alignment Alternative." See, e.g. Nevada DEIS, p. 2-3. But the "'no action alternative generally does not satisfy the proposed action's purpose and need; its inclusion in the Environmental Impact Statement is required by NEPA as a basis for comparison.'" Lockyer at 905, quoting Ronald E. Bass, Albert I. Herson & Kenneth M. Bogdan, The NEPA Book: A Step-by-Step Guide on How to Comply with the National Environmental Policy Act, 95 (2d. ed. 2001). Because the No Action Alternative fails to satisfy the purpose and need of the 2018 Draft EISs, the Draft EISs propose only one alternative: the Management Alignment Alternative. When there is only one alternative, it is not, by definition, an alternative at all. "[T]he agency must consider a range of alternatives that covers the full spectrum of possibilities." Sierra Club v. Watkins, 808 F. Supp. 852, 872 D.D.C. 1991). By proposing the

"Management Alignment Alternative" as the only option to the status quo, BLM has failed to "consider a range of alternatives that covers the full spectrum of possibilities." Id. at 872.

BLM must evaluate additional management alternatives. By failing to thoroughly evaluate more than one alternative, BLM is not complying with NEPA.. See TWS v. Wisely, 524 F. Supp. 2d 1285, 1312 (D. Colo. 2007) (BLM violated NEPA by failing to consider "middle-ground compromise between the absolutism of the outright leasing and no action alternatives"); Muckleshoot Indian Tribe v. US Forest Serv., 177 F.3d 800, 813 (9thCir. 1999) (NEPA analysis failed to consider reasonable range of alternatives where it "considered only a no action alternative along with two virtually identical alternatives"). BLM must consider additional alternatives, including alternatives that are more environmentally protective than the Management Alignment Alternative. The purpose and need of the 2015 Sage-grouse Plans is to "conserve, enhance, and restore GRSG habitat by eliminating or minimizing threats to their habitat" (Rocky Mountain Record of Decision, p. 1-21), while the 2018 amendments are based on a purpose to "enhance cooperation with the states." BLM should consider an alternative that is explicitly focused on enhancing cooperation with the states while conserving, enhancing and restoring sage-grouse habitat. For instance, the projection of on-the-ground activities set out in Table ES-1 of the 2018 EISs shows a reduction in restoration efforts, but a more conservation-oriented alternative would consider increasing these projects. Similarly, this alternative would evaluate how to enhance cooperation with the states while retaining more of the core protections and management approaches that made the previous plans the basis for the FWS determination that listing was no longer warranted under the ESA. This alternative would be more environmentally protective and provide more certainty. We have developed a proposed alternative that would accomplish these goals, set out in detail in Attachment 1, incorporated herein by reference. BLM should also have considered alternatives to complete additional analysis of key protective provisions that it is proposing to eliminate through the DEISs: net conservation gain and Sagebrush Focal Areas (SFA). The DEISs state: The public did not have the opportunity to comment specifically on a net conservation gain approach to compensatory mitigation during the 2015 land use planning process. In addition, the DOI and the BLM are evaluating whether the implementation of compensatory mitigation standard on public lands is appropriate and consistent with applicable legal authorities. We request public comment about how the BLM should consider and implement mitigation with respect to the Greater Sage-Grouse, including alternative approaches to requiring compensatory mitigation in BLM land use plans. See, e.g. Utah DEIS, p. ES-8. The Management Alignment Alternative in the DEISs for Utah and Wyoming proposes to remove this standard. Utah DEIS, p. ES-8; Wyoming DEIS, p. ES-6. Rather than seeking comments only on eliminating this approach, BLM should evaluate an alternative that would retain the approach, while leaving the agency flexibility to determine applicable standards by working with the states. The DEISs also propose eliminating SFAs in Utah, Wyoming, Nevada and Idaho. Utah DEIS, p. 2-6; Wyoming DEIS, p. ES-6; Nevada DEIS, p. 1-8; Idaho DEIS, p. 2-7. BLM's scoping notice stated that the agency "seeks comments on the SFA designation" in response to the decision in Western Exploration, LLC v. U.S. Dep't of the Interior, 250 F. Supp. 3d 718 (D. Nev. 2017), which found BLM must conduct supplemental NEPA analysis in order to support the designation. 82 Fed. Reg. 47248, 47249 (Oct. 11, 2017). As another alternative, BLM should evaluate the impacts of the SFAs without the previously-proposed mineral withdrawal, which has now been withdrawn, in light of how those designations and the important protective measures they provide (in addition to the withdrawal protections) benefit sage-grouse habitat and how application can be better coordinated with the states.

The range of alternatives is insufficient. The Draft EISs only consider one alternative, the "Management Alignment Alternative" and refer to the 2015 Sage-grouse Plans as the "No Action Alternative." This does not meet BLM's obligations under NEPA. The range of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. See 40 C.F.R. §§ 1502.14(a) and 1508.25(c). NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme. Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989) (citations and emphasis omitted). "An agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action." Northwest Envtl Defense Center v. Bonneville Power Admin., 117 F.3d 1520, 1538 (9thCir. 1997). An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9thCir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally protective alternatives and mitigation measures. See, e.g., Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094,1122-1123 (9thCir. 2002) (and cases cited therein). By only meaningfully considering one alternative and not considering alternatives that would be more environmentally protective, BLM has failed to consider a reasonable range of alternatives.

The 2018 Draft EISs also state that their purpose and need is to "better align with … DOI and BLM policy." See, e.g. Nevada DEIS, p. 1-3. That policy was issued on June 7, 2017, through Secretarial Order 3353, "Greater Sage-Grouse Conservation and Cooperation with Western States." The Secretarial Order stated that one of the policy goals for managing the Greater Sage-Grouse is to "give appropriate weight to the value of energy and other development on public lands" in compliance with President Trump's Executive Order of March 28, 2017, "Promoting Energy Independence and Economic Growth" (EO 13783) The new "DOI and BLM policy" is completely opposite of the purpose and need expressed in the 2015 EIS, which identified the "major threats" to sage grouse habitat as "exploration and development" of hard rock mining and fluid mineral development. Nevada DEIS, p. 1-8. The purpose and need for the 2018 Draft EISs - and thus the basis for the 2018 alternatives - has shifted from conservation in 2015 to energy development in 2018: "As analyzed in the [2015 EIS], all of the previously analyzed alternatives, including one proposing constraints stricter than the current management plan, were predicted to result in a loss of development opportunities on public lands (emphasis added)." Nevada DEIS, p. 2-3. The purpose and need of the 2018 Draft EIS, pursuant to Secretarial Order 3353, is to "contribut[e] to economic growth and energy independence" (Nevada DEIS, p. 2-3), or, in other words, increase development opportunities on public lands. Therefore, BLM cannot base the pro-development alternatives in its 2018 Draft EISs upon the 2015 alternatives that had a purpose and need focused on conservation and avoidance of an ESA listing, not energy independence and economic growth. Because the "range of reasonable alternatives is measured against the'Purpose and Need' section," Lockyer at 905, the range of alternatives in the 2018 Draft EIS fail to account for the dramatic change in purpose and need compared to the 2015 EIS, which is a violation of NEPA. 40 C.F.R. §1502.13. In another section of these comments we discuss the purpose and need issue in the 2018 EISs in more detail.

C.3.20 Recreation

These management strategies are more than smart conservation – they also support our local economies. A healthy sagebrush ecosystem is an important economic driver for Western economies and hundreds of other species that live in sagebrush habitat including the golden eagle, elk, pronghorn and mule deer. Research has shown that across the American West, the sagebrush ecosystem powers the outdoor recreation industry to the tune of more than $1 billion—$76 million in Colorado alone.

C.3.21 Sagebrush Focal Areas

Concerns with removal of SFAs in Idaho, Nevada, Utah, and Wyoming. Unfortunately, under the draft land use plans and the accompanying EISs that BLM has prepared for proposed changes to the 2015 Sage-grouse Plans, the BLM would eliminate SFAs in the states of Idaho, Nevada, Utah, and Wyoming. This would include about 8.7 million acres of public land. It represents a tremendous downgrade in land use plan protections that are oriented towards sage-grouse conservation. While BLM previously decided to not pursue the withdrawal from mineral location and entry that was recommended under the 2015 land use plans for the approximately 10 million acres of SFAs that are located in the states of Wyoming, Montana, Idaho, Oregon, Nevada, and Utah, this new, additional proposal represents a further step backward. It is a retreat from environmental protections that have been recognized as needed for sage-grouse conservation by the U.S. Fish and Wildlife Service (and BLM). But given the previous retreat relative to mineral entry, the effect of the current proposed elimination of the SFAs in four of the states in the range of the sage-grouse is somewhat less significant. Still, there will be a number of lost or modified protections that applied to SFAs in one or more of the four states. These include provisions under the 2015 plans that require oil and gas leasing to only be allowed pursuant to a no surface occupancy (NSO) stipulation that was not subject to waiver, exception, or modification (Idaho, Nevada, and Utah); prioritizing SFAs for vegetation and conservation actions (Idaho, Nevada, Utah, and Wyoming); and prohibitions of geothermal development in SFAs (Nevada). These are important protections that must be maintained in priority habitat management areas (PHMA) if SFAs no longer exist in the four states. The value of these protections was recognized by the Fish and Wildlife Service in its 2015 not warranted decision, and thus are a key component of the land use plans that must be maintained if the not warranted decision is to be sustained, which it must be. "Based on our recommendation to further protect sage-grouse population centers that have been identified in the scientific literature as critically important for the species and areas identified through our analysis as important for conservation, BLM and USFS designated areas as Sagebrush Focal Areas (SFA) and added protections that would further limit new, human-caused surface disturbance in SFAs." 80 Fed. Reg. 59858, 59875 (Oct. 2, 2015). SFAs "are the areas that the Federal Plans manage as the highest priority lands in PHMAs for sage-grouse conservation (Figure 5)." Id. at 59878. They are "strongholds" for sagegrouse conservation and as mentioned above contain important connectivity habitat and high densities of breeding birds. Id. The Fish and Wildlife Service recognized that in addition to PHMA protections, the protections mentioned above would also apply in SFAs, including mineral entry withdrawal, NSO stipulations for fluid minerals with no waivers, exceptions, or modifications, and prioritizing management and conservation actions. Id. This was because SFAs need "the most conservative strategies to protect sage-grouse and habitat." Id. Grazing permit review is also prioritized in SFAs. Id. at 59877, 59910. Clearly the protections in SFAs that would be lost by eliminating SFAs must be maintained in the remaining PHMAs, and the land use plan amendments BLM is contemplating must so provide. The BLM should modify the EISs and proposed land use plan amendments in Idaho, Nevada, Utah, and Wyoming to specifically provide that the fluid minerals NSO stipulation with no waivers, exceptions, or modifications, the vegetation and conservation management stipulation, and where

appropriate the prohibition on geothermal development will be specifically incorporated into and made a part of the PHMAs in those states.

Inconsistent treatment across the plans appears arbitrary and capricious. While the BLM is planning to eliminate SFAs in Idaho, Nevada, Utah, and Wyoming, they would be maintained in Oregon and Montana. The BLM provides no explanation for this differential treatment of central aspects of the 2015 Sage-grouse Plans, yet the agency must do so to comply with fundamental legal requirements that apply to Administrative Procedure Act rulemaking efforts, the hard look and public involvement provisions of NEPA, and the land use planning provisions of the FLPMA. In Oregon, the BLM states that SFAs presented "issues [that] require clarification of language in the 2015 ROD/ARMPA but do not require new analysis" and in any event the only issue that requires clarification relative to SFAs is withdrawal from mineral entry. Oregon Draft Resource Management Plan (RMP) and EIS at 1-8. The BLM does not mention Montana in this NEPA analysis because that state desires to leave its 2015 sage-grouse plans intact. Therefore, SFAs would remain intact in Montana. But in Wyoming, Utah, Idaho, and Nevada elimination of SFAs would be pursued with little explanation. In Wyoming "[u]nder the Management Alignment Alternative, there would be no designation of SFAs." Wyoming Draft RMP and EIS at 4-15. According to the BLM, the environmental impact of not having SFAs was considered in the no action alternative in the 2015 Approved Resource Management Plan Amendment (ARMPA), and in the other Wyoming RMPs that did not consider SFAs, the impacts of designating PHMAs encompassed the impacts of SFAs. Id. The BLM seems to believe that its 2016 Draft EIS for Sagebrush Focal Area Withdrawal concluded that SFAs had little conservation benefit and it isonly interested in issues related to the nonexistent mineral withdrawal in any event. Id. at ES-3, 1-8, 4-16. In Idaho, BLM without explanation, states SFAs duplicate protections, focus on mere de minimis activities, do not provide appreciable benefits for sage-grouse, and they complicate the state's adaptive management provisions. Idaho Draft RMP and EIS at ES-3, 1-6. BLM concludes "[t]he removal of SFA designations would have no measurable effect on the conservation of Greater Sage-Grouse in Idaho because the Management Direction proposed for PHMA would remain in place and continue to protect Greater Sage-Grouse habitat. SFA removal would add flexibility for responsible development with stringent requirements including mitigation to achieve a no net loss to Greater Sage-Grouse habitat in PHMA." Id. at 4-10. In Nevada, BLM is again concerned about the nonexistent mineral withdrawal serving as a basis for SFAs and whether SFAs "adequately maintain conservation of Greater Sage-Grouse habitat . . . " Nevada Draft RMP and EIS at ES-3, 1-8, 2-8. In Utah BLM also raises the nonexistent mineral withdrawal as a basis for eliminating SFAs as well as questioning whether they achieve conservation outcomes and concerns about alignment with the state strategy. Utah Draft RMP and EIS at ES-3, 1-7. The explanations for elimination of SFAs in these four states does not establish a clear basis for doing so especially when they would be maintained in Montana and Oregon. This differential treatment and the basis for it must be explained. Fundamentally BLM is creating regulatory uncertainty by creating this patchwork pattern. The need for regulatory certainty, and the fact it was established by the 2015 plans, was a key basis for the Fish and Wildlife Service reaching its not warranted decision. 80 Fed. Reg. 59858. Yet now BLM is creating regulatory uncertainty. This raises questions about whether the sage-grouse will have to be given ESA protections, which in our view should be avoided. At a minimum, to avoid this uncertainty, the SFA protections we have mentioned, like the fluid mineral NSO stipulation with no waiver, exception, or modification, need to made part of the PHMAs in states that no longer have SFAs. Moreover, BLM needs to address whether eliminating SFAs in some states will threaten SFA protections in Oregon and Montana where the SFA designation would remain in place. It would be inappropriate for SFAs to be threatened in Oregon and Montana just because they have been eliminated elsewhere. If

BLM is going to treat SFA designation as subject to state-by-state revocation and not as a range-wide need-a proposition that is totally at odds with the Fish and Wildlife Service not warranted finding not to mention language in the 2015 land use plans-it needs to put in place provisions to ensure the SFA designations are protected where they remain and reconsider the proposals to eliminate SFAs.

Recent legal decisions support maintaining SFAs. There are two recent decisions that BLM should consider as it makes decisions about SFA designations. These are W. Exploration, LLC v. U.S. Dept. of the Interior, 250 F. Supp. 3d 718 (D. Nev. 2017) and Desert Survivors v. U.S. Dept. of the Interior, 2018 U.S. Dist. LEXIS 81922 (N.D. Cal., May 15, 2018). BLM frames Western Exploration as creating a need for these RMP amendments stating changes might be needed "in order to comply with the court's order" and "seeking comment on the SFA designation." 82 Fed. Reg. 47248-49 (Oct. 11, 2017). BLM states that the court "held that the BLM violated NEPA by failing to prepare a supplemental EIS for the designation of SFAs in the 2015 Greater Sage-Grouse Plan in Nevada." Id. at 47248. In fact, Western Exploration does not direct BLM to eliminate SFAs from the land use plans. First, the court found that the BLM had adequately considered any inconsistencies between the Federal sage-grouse plans and local county plans. 250 F. Supp. 3d at 744. The court also found that the BLM met its multiple use responsibilities under FLPMA when it adopted the Nevada sage-grouse plan. Id. at 746. The proposed withdrawal of 2.8 million acres from mineral entry (i.e., the SFAs) did not violate FLPMA. Id. "A review of the administrative record shows that BLM considered the relative value of Nevada's resources." Id. While the court agreed that under NEPA "the designation of 2.8 million acres as Focal Areas in Nevada amounts to a substantial change relevant to environmental concerns, requiring the Agencies to prepare [a supplemental EIS]" the court nevertheless refused to enjoin the ROD implementing the Nevada plan, holding "protection of the greater-sage grouse weighs against vacatur of the RODs. Enjoining implementation of the Plan Amendments pending the Agencies' preparation of an SEIS presents "the possibility of undesirable consequences" to the greater sage-grouse species and their habitat." Id. at 748, 751. Based on this decision, the BLM is not required to eliminate SFAs, as it proposes, but rather, at most, it should only reconsider whether the SFA designations were made with a sufficient opportunity for public comment, and allow for additional public comment if warranted, making, possibly, only mid-course corrections, not summary eliminations. Further, as discussed above, in Desert Survivors the court determined that in withdrawing the proposed ESA listing of the Nevada/California bi-state sage-grouse population the FWS ignored the best available science, improperly concluding voluntary conservation measures could stem the decline of the population. The court held the Service "erred in concluding there was sufficient certainty of effectiveness of planned conservation measures to support the conclusion that listing" the bird as threatened "was no longer warranted." Desert Survivors at 71. "There are no rational grounds for the service's conclusion." Id. at 83. The court held that, "the service must offer some rational basis for its conclusions that future conservation efforts will be effective enough to improve the status of the bi-state (grouse) and therefore warrant withdrawal of the proposed listing." Id. at 64. In reaching its 2015 not warranted finding, FWS concluded that SFAs had a strong scientific basis and were a critical element in showing that BLM had put in place adequate regulatory mechanisms to make listing the sage-grouse unnecessary. Now the BLM is abandoning the commitment to implement SFA protections in much of the range of the sage-grouse. That decision is not based on best available science and must be reassessed.

Clearly the protections in SFAs that would be lost by eliminating SFAs must be maintained in the remaining PHMAs, and the land use plan amendments BLM is contemplating must so provide. The BLM should modify the EISs and proposed land use plan amendments in Idaho, Nevada, Utah, and Wyoming

to specifically provide that the fluid minerals NSO stipulation with no waivers, exceptions, or modifications, the vegetation and conservation management stipulation, and where appropriate the prohibition on geothermal development will be specifically incorporated into and made a part of the PHMAs in those states.

In Oregon, the BLM states that SFAs presented "issues [that] require clarification of language in the 2015 ROD/ARMPA but do not require new analysis" and in any event the only issue that requires clarification relative to SFAs is withdrawal from mineral entry. Oregon Draft Resource Management Plan (RMP) and EIS at 1-8. The BLM does not mention Montana in this NEPA analysis because that state desires to leave its 2015 sage-grouse plans intact. Therefore, SFAs would remain intact in Montana. But in Wyoming, Utah, Idaho, and Nevada elimination of SFAs would be pursued with little explanation. In Wyoming "[u]nder the Management Alignment Alternative, there would be no designation of SFAs." Wyoming Draft RMP and EIS at 4-15. According to the BLM, the environmental impact of not having SFAs was considered in the no action alternative in the 2015 Approved Resource Management Plan Amendment (ARMPA), and in the other Wyoming RMPs that did not consider SFAs, the impacts of designating PHMAs encompassed the impacts of SFAs. Id. The BLM seems to believe that its 2016 Draft EIS for Sagebrush Focal Area Withdrawal concluded that SFAs had little conservation benefit and it is only interested in issues related to the nonexistent mineral withdrawal in any event. Id. at ES-3, 1-8, 4-16. In Idaho, BLM without explanation, states SFAs duplicate protections, focus on mere de minimis activities, do not provide appreciable benefits for sage-grouse, and they complicate the state's adaptive management provisions. Idaho Draft RMP and EIS at ES-3, 1-6. BLM concludes "[t]he removal of SFA designations would have no measurable effect on the conservation of Greater Sage-Grouse in Idaho because the Management Direction proposed for PHMA would remain in place and continue to protect Greater Sage-Grouse habitat. SFA removal would add flexibility for responsible development with stringent requirements including mitigation to achieve a no net loss to Greater Sage-Grouse habitat in PHMA." Id. at 4-10. In Nevada, BLM is again concerned about the nonexistent mineral withdrawal serving as a basis for SFAs and whether SFAs "adequately maintain conservation of Greater Sage-Grouse habitat . . . " Nevada Draft RMP and EIS at ES-3, 1-8, 2-8. In Utah BLM also raises the nonexistent mineral withdrawal as a basis for eliminating SFAs as well as questioning whether they achieve conservation outcomes and concerns about alignment with the state strategy. Utah Draft RMP and EIS at ES-3, 1-7.

The explanations for elimination of SFAs in these four states does not establish a clear basis for doing so especially when they would be maintained in Montana and Oregon. This differential treatment and the basis for it must be explained. Fundamentally BLM is creating regulatory uncertainty by creating this patchwork pattern. The need for regulatory certainty, and the fact it was established by the 2015 plans, was a key basis for the Fish and Wildlife Service reaching its not warranted decision. 80 Fed. Reg. 59858. Yet now BLM is creating regulatory uncertainty. This raises questions about whether the sage-grouse will have to be given ESA protections, which in our view should be avoided. At a minimum, to avoid this uncertainty, the SFA protections we have mentioned, like the fluid mineral NSO stipulation with no waiver, exception, or modification, need to made part of the PHMAs in states that no longer have SFAs. Moreover, BLM needs to address whether eliminating SFAs in some states will threaten SFA protections in Oregon and Montana where the SFA designation would remain in place. It would be inappropriate for SFAs to be threatened in Oregon and Montana just because they have been eliminated elsewhere. If BLM is going to treat SFA designation as subject to state-by-state revocation and not as a range-wide need-a proposition that is totally at odds with the Fish and Wildlife Service not warranted finding not to

mention language in the 2015 land use plans-it needs to put in place provisions to ensure the SFA designations are protected where they remain and reconsider the proposals to eliminate SFAs.

These are important protections that must be maintained in priority habitat management areas (PHMA) if SFAs no longer exist in the four states. The value of these protections was recognized by the Fish and Wildlife Service in its 2015 not warranted decision, and thus are a key component of the land use plans that must be maintained if the not warranted decision is to be sustained, which it must be. "Based on our recommendation to further protect sage-grouse population centers that have been identified in the scientific literature as critically important for the species and areas identified through our analysis as important for conservation, BLM and USFS designated areas as Sagebrush Focal Areas (SFA) and added protections that would further limit new, human-caused surface disturbance in SFAs." 80 Fed. Reg. 59858, 59875 (Oct. 2, 2015). SFAs "are the areas that the Federal Plans manage as the highest priority lands in PHMAs for sage-grouse conservation (Figure 5)." Id. at 59878. They are "strongholds" for sage-grouse conservation and as mentioned above contain important connectivity habitat and high densities of breeding birds. Id. The Fish and Wildlife Service recognized that in addition to PHMA protections, the protections mentioned above would also apply in SFAs, including mineral entry withdrawal, NSO stipulations for fluid minerals with no waivers, exceptions, or modifications, and prioritizing management and conservation actions. Id. This was because SFAs need "the most conservative strategies to protect sage-grouse and habitat." Id. Grazing permit review is also prioritized in SFAs. Id. at 59877, 59910.

IMPORTANCE OF SAGEBRUSH FOCAL AREAS An important component of the existing BLM and Forest Service sage-grouse land use plans is the designation of sagebrush focal areas (SFA). These are the most important sage-grouse habitats, which contain large, contiguous blocks of Federal lands in important sage-grouse habitats that have high levels of population connectivity and densities of breeding birds.

C.3.22 Greater Sage-Grouse

Current finding that listing is no longer warranted. In 2010, FWS determined that the greater sage-grouse warranted listing under the ESA "due to the loss and fragmentation of habitat and a lack of adequate regulatory mechanisms to stem habitat loss."1In 2015, FWS concluded that the species no longer warranted listing, explaining the change in position in a Frequently Asked Questions accompanying its finding as follows: How did the Service arrive at this not warranted finding? In September 2015, the Bureau of Land Management and U.S. Forest Service completed amendments and revisions to 98 separate federal land use plans that address sage-grouse habitat loss, fragmentation, and other threats to the species. This represents the largest landscape-scale conservation planning effort in U.S. history. In addition, states in the greater sage-grouse range developed or updated greater sage-grouse conservation plans. New federal and state regulatory mechanisms developed since 2010 in the Rocky Mountain region have addressed the most serious threats to the species, primarily fossil fuel and renewable energy development, infrastructure such as roads and power lines, mining, improper grazing, the direct conversion of sagebrush to croplands, and urban and ex-urban development. In the Great Basin region, regulatory mechanisms and other conservation efforts developed since 2010 will substantially reduce and mitigate the primary potential threats of wildfire, invasive plants, conifer encroachment and mining.2 Although actual, on-the-ground, measurable improvements to sage-grouse habitat were not accomplished simply by completing the federal plans in 2015, the measures agreed to in those plans, along with those by the states of Wyoming, Montana, and Oregon formed the basis for the FWS finding by meeting the elements of the agency's Policy for Evaluating Conservation Efforts (PECE),

which provides that, in order to rely on a conservation effort, FWS "must find that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species . . .3See, 68 Fed.Reg. 15100 (March 28, 2003) (emphasis added). FWS relied on this policy in its 2015 finding, stating: The [PECE] policy provides guidance on how to evaluate conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness. The evaluation focuses on the certainty that the conservation efforts will be implemented and the effectiveness of the conservation efforts to contribute to make listing a species unnecessary. In this finding, we evaluated the certainty that the Federal Plans, and the Montana and Oregon Plans will be implemented into the future and the certainty that they will be effective in addressing threats, based on the best available science and professional recommendations provided in the COT and other scientific literature and reports. 80 Fed.Reg. 59874 (October 2, 2015) (emphasis added).

BLM cannot rely on perch inhibitors to reduce impacts to sage grouse, as these do not address the behavioral avoidance of sage grouse of tall structures, and don't even completely prevent raptor perching. Prather (2010) provided an empirical test of the effectiveness of perch inhibitors on smaller distribution lines in Utah, and found that they had no significant effect in terms of reducing raptor perching activity. Lammers and Collopy (2007) found similar results for larger transmission lines in Nevada.

Geophysical exploration can result in numerous impacts to sage grouse, including crushing sagebrush, creating linear disturbances through sagebrush habitat that facilitate the movements of sage grouse predators, causing direct disturbance to birds, leading to stress and/or displacement from important habitats, and direct collision mortality. For these reasons, the National Technical Team (2011) recommended, "Allow geophysical operations only by helicopter-portable drilling methods and in accordance with seasonal timing restrictions and/or other restrictions that may apply." The existing RMPAs neglect to provide definable seasonal restrictions on geophysical exploration in important sage grouse habitats, and also does not prescribe that low-impact techniques (i.e., heliportable methods) be applied, and the amendments to the RMPAs need to redress this deficiency.

THE DIRECTION OF THE OVERALL CHANGES TO THE 2015 SAGE-GROUSE PLANS RISKS THE FINDING THAT THE GREATER SAGE-GROUSE NO LONGER WARRANTS LISTING UNDER THE ENDANGERED SPECIES ACT. Although the FWS found that the greater sage-grouse no longer warranted listing under the ESA in 2015, the actions that this administration has taken and proposed are undermining the reasons for that finding, imperiling the species. Walking away from the vital commitments in the BLM's 2015 Sage-grouse Plans will have unavoidable consequences for the grouse, the more than 350 species that rely on the same habitat and the many stakeholders who have benefitted from the current, flexible management of millions of acres of public lands. If the administration continues on the present track, then: * Actual protections in BLM's 2015 Sage-grouse Plans - the "foundation" of FWS's 2015 not warranted decision - would be weakened or removed altogether, despite a wealth of science showing they are needed; * Commitments to implement and fund other meaningful protections will continue to be formally abandoned or made doubtful; and. * Without reliable, effective actions to address ongoing threats to greater sage-grouse, there will no longer be a basis for finding that a listing is not warranted, leading to action by the FWS and/or the courts to protect the species and its habitat.

The FWS's 2015 finding explicitly relied on specific conservation measures in BLM's 2015 Sage-grouse Plans to address major threats, such as oil and gas development. For example, with respect to oil and gas in the Frequently Asked Questions: How do the conservation actions address the threat of oil and gas development in greater sage-grouse habitat? Oil and gas development is likely to continue throughout the greater sage-grouse range into the future, although its form and extent across the landscape may change. For this status review, the Service mapped locations of the highest potential for of oil and gas development in Montana, the Dakotas, Wyoming, Colorado and northeastern Utah to quantify potential exposure of greater sage-grouse to risk of future development. The Service's analyses indicate that the federal land use plans and the Wyoming Core Area Strategy are reducing exposure of the species to fossil fuel development, as measured by the portions of the breeding population and breeding habitat. The Service estimates that the vast majority of lands with a high- to moderate potential for oil and gas development are outside Priority Habitat. Regulatory mechanisms further reduce the risk of nonrenewable energy exposure to the breeding population and breeding habitat by more than 35 percent in Montana, Wyoming's Powder River Basin and the Dakotas, and more than 60 percent in the rest of Wyoming and adjacent portions of Colorado and Utah

The NSO buffers in the plan are likely insufficient to protect wintering sage grouse. While surface disturbance could be prohibited up to 3.1 miles around leks, sage-grouse will still avoid development within 1.75 miles of wellpads and other development during winter (Holloran et al. 2015), or within 1.9 miles of wellpads during the breeding season (Holloran 2005), as discussed above. Thus, development near these buffer zones could still cause sage grouse to avoid otherwise suitable winter areas falling within lek buffer zones. No analysis shows that enough winter habitat will be left undisturbed under existing ARMPAs to support local populations. Absent a clear definition of "winter habitat" and "winter concentration area" and the distinction between the two, BLM should adopt a plan that provides adequate disturbance and vegetation protection for all identified winter habitats. In the current Plans, it is unclear whether these terms are interchangeable or distinct concepts. The NTT defines "winter concentration areas" as: Sage-grouse winter habitats which are occupied annually be sage-grouse and provide sufficient sagebrush cover and food to support birds throughout the winter (especially periods with above average snow cover). Many of these areas support several different breeding populations of sage-grouse. Sage-grouse typically show high fidelity for these areas, and loss or fragmentation can result in significant population impacts. NTT 2011, p. 37. Winter habitat, on the other hand, may be areas that have favorable sagebrush conditions for sage grouse throughout the winter, regardless of whether sage grouse annually occupy these areas. Wintering areas not utilized in typical years may become critical in severe winters. Caudill 2013. Thus, all winter habitat should be protected. Finally, as detailed in previous comments, BLM's winter habitat health objectives must have scientific support. These objectives should require 20-30% crown cover with shrub heights 25-35 cm above the median snow level, or greater than 40 cm in height, whichever is taller. See Center for Biological Diversity Nevada RMPA DEIS Comment, p. 22. PHMA designations may not be adequate to protect sage-grouse wintering habitats. For example, in Wyoming, Dinkins et al. (2016) found that PHMAs protected 62.5% of breeding locations in Wyoming, but only 50% of wintering habitats. These researchers recommended designating winter concentration areas outside PHMAs for elevated habitat protections. BLM should suspend mineral leasing and all other development activities until all winter habitat is identified. Identified winter habitats, whether inside or outside of Priority Habitats, should be closed to future mineral leasing and materials sales and withdrawn from locatable minerals entry. For valid existing rights both agencies should impose a 3% surface disturbance limit and one pad limit, both calculated per square mile section of winter habitat; No Surface Occupancy within 1.75 miles of the edge of wintering habitats; and no high-volume

roads within 1.9 miles of wintering habitats. Wintering habitats should be seasonally closed to all vehicular access between November 30 and March 15. If BLM will not protect all winter habitat as requested, BLM should suspend mineral leasing and all other development activities in winter 63 habitat until winter concentration areas are identified. These winter concentration areas should receive the same protections as the NTT recommends for priority habitats. BLM should also tailor winter habitat objectives to 20-30% crown cover with shrub heights 25-35 cm above the median snow level, or greater than 40 cm in height, whichever is taller.

Wastewater ponds associated with coalbed methane development form breeding habitat for the Culex tarsalis mosquitoes that transmit West Nile virus, and have been directly linked to increases in these mosquito populations (Zou et al. 2006, Doherty 2007). The National Technical Team (2011: 19) observed that "ponds created by coal bed natural gas development may increase the risk of West Nile virus mortality in late summer (Walker et al. 2004, Zou et al. 2006, Walker 3 Id. 4 Green et al. at 9. 52 et al. 2007b)." In addition, Kirol et al. (2015b) found that coalbed methane wastewater ponds subsidize sage-grouse nest predators, and that pond shoreline length was the single greatest correlate with sage-grouse nest failure. Greater sage grouse have essentially no ability to develop immunity to West Nile virus (Naugle et al. 2004), and outbreaks of West Nile have led to catastrophic population losses of sage grouse in habitats developed for coalbed methane in the past (Walker et al. 2004). Sinai et al. (2017) found that sage-grouse did not produce antibodies against West Nile, and in addition were susceptible to avian leukosis virus. Taylor et al. (2012) found that the synergy of oil, gas and coalbed methane impacts and West Nile would result in the functional extinction of the Powder River Basin sage grouse population in Wyoming as a result of the next major West Nile virus outbreak.

Sage grouse avoid habitats 54 surrounding roads (Braun 1986, Holloran 2005, Wisdom et al. 2011). According to BLM's own NEPA analysis: Impacts on GRSG accrue over varying distances from origin depending on the type of development: … ? Interstate highways at 4.7 miles (7.5 kilometers) and paved roads and primary and secondary routes at 1.9 miles (3 kilometers) based on indirect effects measured through road density studies (Connelly et al. 2004; Holloran 2005; Lyon 2000) Nevada - Northeastern California Greater Sage-grouse RMP Amendment DEIS at 605. BLM has admitted that roads fragment habitats and interfere with natural movements of sensitive species, and with regard to road upgrades, "Any exceptions resulting in road upgrades could further fragment habitat, cause vegetation loss, erosion, and the spread of invasive, nonnative plant species." Wyoming Greater Sage-grouse RMP Amendment DEIS at 4-313 and 4- 294, respectively. BLM's own National Technical Team (2011: 11) recommended that at minimum, vehicle traffic in Priority Habitats be limited to designated roads and trails, use existing roads for access, limit construction to realignments of existing routes that minimize impacts to sage grouse, prohibit road upgrades that change route category, consider seasonal road closures, and conduct travel planning within 5 years, reclaiming roads and trails not designated for vehicular use. Road densities are also an issue, because sage grouse avoid habitats adjacent to roads. Holloran (2005) found that road densities greater than 0.7 linear miles per square mile within 2 miles of leks resulted in significant negative impacts to sage grouse populations. This road density should be applied as a maximum density in Priority and General Habitats, and in areas that already exceed this threshold, existing roads should be decommissioned and revegetated to meet this standard on a per-square-mile-section basis. BLM's proposed plan amendment fails to provide adequate limits on road density. Limiting road and trail networks and off-road vehicle travel also is critical in limiting the spread of invasive weeds. According to BLM's own NEPA analysis, "Roads and trails are one of the main vectors of invasive weed spread, which leads to increase in FRCC and ecosystems moving away from natural fire

regimes (CEC 2012)." Nevada - Northeastern California Greater Sage-grouse RMP Amendment DEIS at 701. Off-road vehicle travel must be adequately regulated to protect sage grouse under new plans. According to BLM's own analysis, off-road vehicles are noisy, and typically exceed the background noise levels by more than 10 dBA. Northwest Colorado Greater Sage-grouse RMP Amendment DEIS at 399. This level of noise exceedance has significant negative consequences for sage grouse, as outlined in the section of this protest addressing noise. Off-road vehicle use also results in habitat degradation and destruction, disturbance of sage grouse, and proliferation of invasive weeds (NTT 2011; see also Manier et al. 2011).

winter concentration areas should receive at least the level of protection from permitted industrial activities as recommended by NTT (2011) for priority habitats. As it stands now, unlimited surface disturbance is allowed in all winter concentration areas and winter habitat outside of priority habitats, risking significant winter habitat loss. This EIS must discuss these impacts resulting from development and sagebrush removal in winter habitat or respond to comments noting these impacts. Nor does it provide any sense of the long-term impact of winter habitat loss on the persistence of local sage grouse in the planning area. Moreover, BLM must identify baseline winter habitat and winter concentration areas to create a science-based understanding of any plan amendment's impacts on wintering sage grouse. Even if it were proper for BLM to postpone the identification of winter habitat, the EIS must analyze any specific plans as to how and when this will occur or the criteria these areas must meet for winter habitat protections to apply. And the planning amendment must provide for interim protections for these areas until mapping is complete. In the absence of interim protections, it is thus entirely possible that sage-grouse wintering areas will be irreparably damaged and sage-grouse populations lost before they can receive minimal protections that apply today under the ARMPAs, let alone the full set of protections needed for winter habitat based on the science. At minimum, any leasing or development of parcels that potentially contain winter habitat should be suspended until winter habitat and winter concentration areas are fully mapped and designated appropriate protections. This is extremely critical: Without any restrictions on sagebrush removal in wintering habitats, the habitat loss will be permanent. See Minnick 2015 (well sites lacked favorable soil conditions decades after reclamation, preventing sagebrush regrowth); cf. FEIS 4-315 (winter concentration areas "could be difficult to restore to original conditions…due to the composition and size of sagebrush in these areas"). Indeed, to the extent the EIS relies on winter habitat restoration as "mitigation" for any habitat loss, this is wishful thinking. Even a short-term loss of winter habitat would likely be detrimental to sage grouse dependent on these areas

C.3.23 Travel and Transportation Management

Travel planning should be carried out to address the risks of habitat destruction and fragmentation acknowledged in the plans.

C.3.24 Waivers, Exceptions, and Modifications

Waivers, exceptions and modifications to oil and gas lease stipulations must be subject to narrow and specific criteria so they are consistently and reliably applied, and can be effective as intended. In addition, applications for and responses to waivers, exceptions and modifications should be tracked and made available to the public.

Finally, it is critical that BLM track waivers, exceptions and modifications requested and those granted, and make that information available to the public. These records will provide important insight into how the stipulations are being applied and the potential impact of waivers, exceptions and modifications on

the overall function of the plans. This information will also allow BLM to determine if the availability of or criteria for granting waivers, exceptions and modifications needs to be further narrowed in order to ensure sufficient protection for sage-grouse habitat. Accordingly, we recommend that each plan include language that provides: Exceptions will be considered prior to considering waivers or modifications. If the BLM determines that a waiver or modification is more appropriate, the reasons for such decisions will be documented. Waivers are permitted if the area lacks "protected attributes" - as determined through coordination with the appropriate state wildlife agency. Modifications and exceptions are permitted if: (1) impacts are fully and verifiably offset by compensatory mitigation; or (2) there are no impacts to greater sage-grouse because of terrain or habitat type, based on consultation with the applicable state wildlife agency. Prior to granting any waivers, exceptions and modifications, BLM will insure that the U.S. Fish and Wildlife Service has the opportunity to submit information for consideration. For no surface occupancy stipulations or stipulations in Priority Habitat Management Areas, waivers exceptions and modifications will only be granted following a 30-day public notice and comment period. BLM will maintain an ongoing record of requests for waivers, exceptions and modifications and whether those requests are granted, and will publish those cumulative results on a quarterly basis.

V. RECOMMENDED APPROACH TO WAIVERS, EXCEPTIONS AND MODIFICATION TO OIL AND GAS LEASE STIPULATIONS. The 2015 Sage-grouse Plans include numerous oil and gas lease stipulations that apply to development in order to protect sage-grouse and sage-grouse habitat, including no surface occupancy stipulations, timing limitations and surface use limitations. The draft amendments and EISs also rely on lease stipulations. However, the protections actually provided by the stipulations are only reliable and effective to the extent that the safeguards are applied. Waivers (permanent exemption that applies to the entire leasehold), exceptions (one-time exemption for a particular site within the leasehold) and modifications (change to the lease stipulation, either temporarily or for the term of the lease, can apply to the entire leasehold or certain areas) all permit an operator to avoid compliance with the requirements of a stipulation. Where these loopholes are permitted and used, the protections that the stipulations are supposed to provide can be undermined. Recent studies confirm that oil and gas development can harm both sage-grouse habitat and lifecycle activities, such as breeding.46Consequently, it is vital that protections associated with oil and gas development are reliably applied and, as a result, that waivers, exceptions and modifications are not broadly used to weaken those protections. While we can accept narrowly prescribed waivers, exceptions and modifications to lease stipulations that are based on very specific criteria, broad standards, such as those currently included in the Nevada Draft RMP Amendment/EIS are not acceptable. As an example, the general approach conditions included in the Draft Colorado RMP Amendment related to no surface occupancy stipulations are more specific and include public engagement. * Waivers are permitted if the area lacks "protected attributes" - as determined through coordination with Colorado Parks and Wildlife and following a 30-day public notice/comment period * Modifications and exceptions are permitted if: (1) impacts are fully offset by compensatory mitigation; or (2) no impacts to greater sage-grouse would occur because of terrain or habitat type - but can only be applied after consultation with Colorado Parks and Wildlife. CO Draft RMP Amendment/EIS, pp. 2-4 - 2-5. Overall, one-time exceptions should be the preferred approach where relief is sought from protective stipulations, such that the safeguards prescribed in these stipulations will remain in place for the majority of oil and gas leases. Waivers, exceptions and modifications should only be granted from no surface occupancy (NSO) stipulations or any stipulations in PHMA after a 30-day public notice and comment period. Further, the U.S. Fish and

Wildlife Service should have the opportunity to submit information for consideration prior to granting waivers, exceptions and modifications.

C.4 NEVADA-CALIFORNIA-SPECIFIC COMMENTS

C.4.1 Purpose and Need

The purpose and need of the DEIS is too narrowly focused and a shift from the original 2015 EIS and analysis of the range of alternatives.

The purpose and need of the DEIS is too narrowly focused and a shift from the original 2015 EIS and analysis of the range of alternatives.

BLM'S purpose and need violates NEPA. BLM is employing an unlawful "purpose and need" for the Draft EIS. While BLM has some discretion over a project's "purpose and need," that discretion is not unlimited. BLM may not, for example, define the "purpose and need" so narrowly that it forecloses consideration of a reasonable range of alternatives. Westlands Water Dist. v. U.S. DOI, 376 F.3d 853, 867 (9th Cir. 2004); see also City of Carmel-By-The Sea v. U.S. Dep't of Transp., 123 F.3d 1142, 1155 (9th Cir. 1997) (". . . an agency cannot define its objectives in unreasonably narrow terms."). Nor may BLM simply adopt the "purpose and need" advanced by a project proponent. National Parks Conservation Ass'n v. BLM [NPCA], 606 F.3d 1058, 1070-72 (9th Cir. 2010). Yet, that is exactly what BLM has done here. It has developed an unreasonably narrow "purpose and need" for the Draft EIS that forecloses consideration of any alternative that does not "align with individual state plans. . . ." See NV/CA Draft EIS at ES-2. Further, it is self-evident that this "purpose and need" was defined not by BLM, as required by NEPA, but by the states/project proponents. Thus, BLM's "purpose and need" is fundamentally flawed and corrupts the range of alternatives, along with other aspects of the Draft EISs. 1. BLM's "Purpose and Need" for the Draft EISs is unreasonably narrow. In violation of NEPA, BLM is using an unreasonably narrow "purpose and need" for the Draft EIS. According to the Draft EIS, "[t]he purpose of this resource management plan amendment/environmental impact statement (RMPA/EIS) is to enhance cooperation with the states by modifying the approach to Greater Sage-Grouse management in existing land use plans to better align with individual state plans and conservation measures and with DOI and BLM policy." NV/CA Draft EIS at ES-2. This represents a dramatic departure from the original purpose behind BLM's sage-grouse conservation plans, which was based entirely on the need to develop "adequate regulatory mechanisms" that would avoid the need to list the species under the ESA. See NV/CA Greater Sage-Grouse Approved RMP at 1-8. Yet, BLM has totally and impermissibly eliminated this fundamental objective from the Draft EIS. When evaluating the reasonableness of an agency's "purpose and need" statement, courts consider the views of Congress . . . in the agency's statutory authorization to act, as well as in other congressional directives." Citizens Against Burlington v. BUSEY IV, 938 F.2d 190, 196 (D.C. Cir. 1991). Here, "Congress intended endangered species to be afforded the highest of priorities." Tenn. Valley Auth. v. Hill, 437 U.S. 153, 174 (1978). Accordingly, the ESA requires BLM to administer programs that "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. . . ." 16 U.S.C. § 1531(b); see also id. § 1536(a)(1) ("The Secretary shall . . . utilize such programs in furtherance of the purposes of [the ESA].").

Because the 2018 Draft EIS states a different purpose and need compared to the 2015 EIS, BLM, pursuant to Lockyer, must necessarily consider a new range of alternatives to meet that new purpose and need. Under Lockyer, BLM in 2018 cannot tier to alternatives considered for the different purpose and need of the 2015 EIS.

The purpose and need of the 2018 Draft EIS, pursuant to Secretarial Order 3353, is to "contribut[e] to economic growth and energy independence" (NV/CA Draft EIS at 2-3), or, in other words, increase development opportunities on public lands. Therefore, BLM cannot base the pro-development alternatives in its 2018 Draft EIS upon the 2015 alternatives that had a purpose and need focused on conservation and avoidance of an ESA listing, not energy independence and economic growth. Because the "range of reasonable alternatives is measured against the 'Purpose and Need' section," Lockyer at 905, the range of alternatives in the 2018 Draft EIS fail to account for the dramatic change in purpose and need compared to the 2015 EIS, which is a violation of NEPA. 40 CFR §1502.13.

Instead, the EISs and LUPAs were constructed upon the false assumption that listing was warranted unless extra conservation measures were implemented. Impartial analysis demonstrates that the greater sage-grouse does not meet the criteria to be listed as endangered or threatened, so there was no need to change the land use plan direction that existed before the LUPAs were approved because the identified purpose was already met. Thus, the scope of the 2017 NOI regarding greater sage-grouse conservation should begin with an analysis to see if the original purpose, to avoid an ESA listing, could be achieved by simply vacating each of the LUPAs and reverting back to the previous land use plan direction.

1 1-3 2-10 It is crucial that BLM ensure the Purpose and Need is based on legal authorities and requirements. This section could better bolster the legal foundation for any changes that flow from this EIS, including an explanation of the Court Order

If there are any changes that experts deem necessary, these should instead be done via minor plan amendments, also known as "maintenance actions." A complete rewrite is an unnecessary waste of federal resources, and risks upending the FWS's 2015 finding.

Purpose/Need for proposed amendments: First of all, I am unaware of any "new" or old scientific information which supports "refinements" to the 2015 GRSG conservation plans. In fact, the draft EIS fails to provide credible scientific support for any of the proposed changes. As a participant in the development of GRSG conservation plans in Nevada and Eastern California, I was concerned that the plans were not restrictive enough in addressing the major threats to GRSG, including loss and fragmentation of habitat especially by wildfires and invasive weeds in Nevada and the lack of regulatory certainty by land and resource managers to address these problems.

C.4.2 Issues Dismissed from Detailed Analysis

Disturbance and Density Caps The contribution of disturbance caps toward greater sage-grouse conservation was not considered in the RMPA/EIS. WREC believes the requirement of a three percent disturbance cap discourages the clustering of anthropogenic disturbances and encourages a project proponent to search for an area that is not currently disturbed to pursue a project. Standards and Guidelines throughout the current Plan, that would be applied regardless of Alternative A or B in the RMPA/EIS, call for disturbances to be grouped together; however, many are not able to be grouped due to the three percent disturbance cap. WREC POWER ENGINEERS, INC. PAGE 4 experienced this frustration directly with a recent new distribution line ROW application. Despite placing the distribution line in close proximity to an interstate highway, a town, a housing subdivision, a state highway, an open-pit mine, and a railway, WREC was told the distribution line could not be approved because it was above the three percent disturbance cap. WREC requests flexibility be developed into the three percent

disturbance cap to accommodate for clustering proposed projects in areas that are already disturbed, and not restricting them based on the level of current disturbance in the Final RMPA/EIS.

it is imperative that an earnest analysis of the predation problem be included in the planning process and that the final decision regarding greater sage-grouse address the urgent need for the Migratory Bird Treaty Act to be amended so that it no longer prevents managers from being able to effectively control nuisance bird species in situations where excessive populations of such species interferes with other management goals and objectives.

Because ravens (and other corvids) are protected under the Migratory Bird Treaty Act, neither the Federal or State plans regarding greater sage-grouse management adequately address the predation issue. It is imperative that an earnest analysis of the predation problem be addressed by the planning process.

The final decision regarding greater sage-grouse must report the urgent need for the Migratory Bird Treaty Act to be amended so that it no longer prevents managers from being able to effectively control nuisance bird species where they interfere with other management objectives.

NCA recognizes the rationale provided here why additional analysis will not occur for Wild Horses and Burros (WHB). However, the provisions and management decisions related to WHB in the previous process have not been adhered to. The EIS should address this issue and be frank and propose real, actionable solutions to the WHB issue that were not identified in the previous EIS. The previous EIS failed to acknowledge that WHB remain on the public lands on a year-round basis and are not managed for the benefit of the rangeland resource that supports their very existence. Impacts to key habitats by unchecked horse populations cannot continue to be ignored. Only their numbers are attempted to be controlled, but with minimal success. There typically are no rest periods for the range in HAs or HMAs, riparian areas nor wetland meadows. Numbers control is all that the BLM has available to them today to effectively manage horses, and Congress has again placed prohibition on how BLM can use funding to address excess on-range WHB. In addition, any attempts to restore rangelands to benefit GSG within HMA's is improbable due to the restrictions that would be applied when attempting to protect a new seeding or defer use from an area for a period of time to allow for natural regeneration. Fencing and other structural improvements would also become a real challenge. Given the actual performance record of BLM and the exceedingly out-of-control numbers, how will the actual corrections be brought about that the previous EIS proposed?

This fails to point out the limiting factor on raven control, limited take. State wildlife and agricultural agencies have a limited take based on a permit issues by USFWS, because of the Migratory Bird Treaty Act. This has hamstrung the ability to implement the appropriate scale and duration of raven control. This has resulted in the "science" that exists and is biased because the science was based on discrete timeframes and not sustained efforts. However, since the EIS fails to properly analyze predator control, the answers will not be found in this process. That is partially why NCA advocates for adequately analyzing predator control in this EIS.

BLM previously argued and is adopting by reference that the issues of hunting and predator control are outside of their jurisdiction and authority. It is impossible to holistically frame management without analyzing the cumulative effects and recognizing their role. Also, the agencies with jurisdiction by law and special expertise on the issue of hunting and predation are cooperating agencies (e.g., FWS, NDOW,

USDA, NDA, counties). It is not an issue of whether or not BLM can implement predator control, but it is an issue of the magnitude of predation as a factor in causing the decline in sage-grouse populations that needs to be in the analysis to provide perspective on how effective management actions under the authority of BLM will be in sustaining sage-grouse populations and habitats. The BLM NEPA Handbook speaks to "expanding the scope of a NEPA analysis to consider connected and cumulative actions of all cooperating agencies into a single document improve overall interagency coordination" (p. 112). Also, the CEQ regulations speak to streamlining and eliminating duplication while satisfying NEPA (40 CFR 1506.2(b)). CEQ guidance is clear that even items not under full or even partial control of BLM/USFS must still be analyzed when connected and when a major component. As highlighted in the BLM NEPA Handbook (H-1790-1) and mandated by law, the EIS must "rigorously explore and objectively evaluate all reasonable alternatives" (40 CFR 1502.14(a) and NEPA Sec. 102(2)(C)(iii)) and "study develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources" (NEPA Sec. 102(2)(E)). * Of note is that "[i]n determining the alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of implementing an alternative. 'Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable…' (Question 2a, CEQ, Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981)'" (BLM NEPA Handbook p. 50). Further, CEQ provides guidance on framing "relevant, reasonable mitigation measures" even if they are outside the jurisdiction of the agency Question 19ba, CEQ, Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981). Further, "while some mitigation strategies are within the BLM's control…most mitigation strategies require action by other government entities-typically cities, counties, and State agencies….the relevant, reasonable mitigation measure are likely to include mitigation measure that would be carried out by other Federal, State or local regulatory agencies or tribes. Identifying mitigation outside of BLM jurisdiction serves to alert the other agencies that can implement the mitigation. (BLM NEPA Handbook p. 62). It is very clear in CEQ regulations (specifically 1502.14(f) and 1502.16(h)) that speak to mitigation irrespective of jurisdiction. Also, the CEQ FAQ 19b is very clear in presenting the CEQ guidance related to this exact issue (in which guidance has been in place since 1981): 19b. "How should an EIS treat the subject of available mitigation measures that are (1) outside the jurisdiction of the lead or cooperating agencies, or (2) unlikely to be adopted or enforced by the responsible agency? A. All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed as part of the RODs of these agencies. Sections 1502.16(h), 1505.2(c). This will serve to [46 FR 18032] alert agencies or officials who can implement these extra measures, and will encourage them to do so. Because the EIS is the most comprehensive environmental document, it is an ideal vehicle in which to lay out not only the full range of environmental impacts but also the full spectrum of appropriate mitigation. However, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed. Thus, the EIS and the Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies. Sections 1502.16(h), 1505.2. If there is a history of non-enforcement or opposition to such measures, the EIS and Record of Decision should acknowledge such opposition or non-enforcement. If the necessary mitigation measures will not be ready for a long period of time, this fact, of course, should also be recognized." Just because hunting and predation are outside of BLM jurisdiction does not mean that the analysis and subsequently identified mitigation are unnecessary or not required. How can BLM address all connected GSG impacts and actions without analyzing predators and hunting effects and identifying proper mitigation? The full picture

will not be answered and the analysis falls short in disclosing what can be done, holistically, to address GSG conservation. It can be demonstrably argued that predation, previously identified as a USFWS-identified threat is a significant issue and that analysis of this issue is necessary to make a reasoned choice between alternatives, especially since the Nevada State Plan includes scientifically-based predator control. Predation and predator control are significant issues that should be analyzed.

The 2015 RMPA erred, and the 2018 DRMPA errs, in refusing to address predator control, particularly avian predator control.

the RMPA should address and require control of sage grouse predators.

Of addition concern in the DRMPA is the lack of consideration of across-the-board declines in habitat or sage-grouse numbers due to climate in the region (Nevada and NE California) and the West. The 2018 DRMPA appears to ignore these larger climate groups in its process. Coates et al. 2017 expressly calls for identifying changes "from the top down"; that is, are similar trends occurring throughout the range, or within the Great Basin that are not occurring throughout the range; or are occurring throughout Nevada that are not occurring in the remainder of Great Basin; or that are occurring within one or more of the climate clusters that are not occurring in the others? Coates et al. 2017 contrasted the smaller scale clusters (that is, lek and neighborhood cluster) against the climate cluster, and the climate cluster was contrasted against the region. See Coates et al. 2017 page 8 (pdf 18). The RMPA should adopt this approach.

ROLE OF SCIENCE—PREDATORS AND NOISE Sadly, two important issues were eliminated from further study in the 2018 EIS—predators and the impacts of noise on Greater sage-grouse. Predation has been shown to be a significant factor in Nevada (Coates et al. 2007*, followed by multiple papers since and as recent as 2016). The rapid increase of predators in Nevada has been linked to land management and anthropogenic changes that the BLM should consider in future decisions, even if raven management is not practical. *[Efficacy of CPTH-treated egg baits for removing ravens]

I also wish to protest the failure to re-engage on the noise limitations (Appendix K, 2015 FEIS). This regulation is not based on science. In fact, inclusion of Amstrup and Phillips 1977 based on a comment, shows that science is not the motivation for this regulation; given that the statement supported by this citation states that noise does not diminish rapidly with distance, whereas noise does diminish in a predictable manner, following fundamental rules of physics. The BLM's 2015 FEIS addresses noise on pages 4-16 to 4-18. However, none of the references cited in these sections are studies with stated hypotheses related to noise or identify specific noise levels that cause harm to the Greater sage-grouse. Many of the studies cited have no specific data on noise, and nearly all of them are merely speculative or cite other documents that also do not have any data regarding impacts of noise on Greater sage-grouse. About two-thirds of the references actually mention Greater sage-grouse, though many are not directly related to noise, and none appear to have actual field data related to noise and Greater sage-grouse. Most basic to a scientific-based argument is to cite the references used to build an argument precisely enough that the reader can fact check your interpretation of previous work. The exercise of trying to determine at what levels noise affects Greater sage-grouse and to verify the argument for regulating noise is complicated by the fact that the reference list in the FEIS (2015, provided in Chapter 7) is not complete or consistent (Patricelli et al. 2013; Blickley and Patricelli 2012/2013?; Patricelli and Blickley 2012) with the citations provided in these short two pages. Further, not all references are easily obtainable (Amstrup and Phillips 1977; Kaiser 2006; Blickley and Patricelli 2012/2013?; Patricelli and

Blickley 2012). These failings violate requirements of the Data Quality Act. Failures such as not anchoring regulations in science, and compounding that by not making the science used available to the public, only invite lawsuits and leave project proponents with little trust that their expenditures actually have an impact on the environment as we would hope.

ES-3.3 ES-7 P 2, Bullet 8 NACO struggles with including "Recreation" under "resource topics dismissed from detailed analysis", given public land recreation's direct link with access to public lands and the potential changes to Comprehensive Travel Management. At a minimum, this linkage should be acknowledged.

1 1-11 24-25 Hunting and predator control should be analyzed in the EIS. BLM previously argued and is adopting by reference that the issues or hunting and predator control are outside of their jurisdiction and authority. It is impossible to holistically frame management without analyzing the cumulative effects and recognizing their role. Also, the agencies with jurisdiction by law and special expertise on the issue of hunting and predation are cooperating agencies (e.g., FWS, NDOW, counties). It is not an issue of whether or not BLM can implement predator control, but it is an issue of the magnitude of predation as a factor in causing the decline in sage-grouse populations that needs to be in the analysis to provide perspective on how effective management actions under the authority of BLM will be in sustaining sage-grouse populations and habitats. The BLM NEPA Handbook speaks to "expanding the scope of a NEPA analysis to consider connected and cumulative actions of all cooperating agencies into a single document improve overall interagency coordination" (p. 112). Also, the CEQ regulations speak to streamlining and eliminating duplication while satisfying NEPA (40 CFR 1506.2(b)). CEQ guidance is clear that even items not under full or even partial control of BLM/USFS must still be analyzed when connected and when a major component. As highlighted in the BLM NEPA Handbook (H-1790- 1) and mandated by law, the EIS must "rigorously explore and objectively evaluate all reasonable alternatives" (40 CFR 1502.14(a) and NEPA Sec. 102(2)(C)(iii)) and "study develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources" (NEPA Sec. 102(2)(E)). Of note is that "[i]n determining the alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of implementing an alternative. 'Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable…' (Question 2a, CEQ, Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981)'" (BLM NEPA Handbook p. 50). Further, CEQ provides guidance on framing "relevant, reasonable mitigation measures" even if they are outside the jurisdiction of the agency Question 19ba, CEQ, Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981). Further, "while some mitigation strategies are within the BLM's control…most mitigation strategies require action by other government entities-typically cities, counties, and State agencies….the relevant, reasonable mitigation measure are likely to include mitigation measure that would be carried out by other Federal, State or local regulatory agencies or tribes. Identifying mitigation outside of BLM jurisdiction serves to alert the other agencies that can implement the mitigation. (BLM NEPA Handbook p. 62). It is very clear in CEQ regs (specifically 1502.14(f) and 1502.16(h)) that speak to mitigation irrespective of jurisdiction. Also, the CEQ FAQ 19b is very clear in presenting the CEQ guidance related to this exact issue (in which guidance has been in place since 1981): 19b. "How should an EIS treat the subject of available mitigation measures that are (1) outside the jurisdiction of the lead or cooperating agencies, or (2) unlikely to be adopted or enforced by the responsible agency? A. All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are

outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed as part of the RODs of these agencies. Sections 1502.16(h), 1505.2(c). This will serve to [46 FR 18032] alert agencies or officials who can implement these extra measures, and will encourage them to do so. Because the EIS is the most comprehensive environmental document, it is an ideal vehicle in which to lay out not only the full range of environmental impacts but also the full spectrum of appropriate mitigation. However, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed. Thus, the EIS and the Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies. Sections 1502.16(h), 1505.2. If there is a history of non-enforcement or opposition to such measures, the EIS and Record of Decision should acknowledge such opposition or non-enforcement. If the necessary mitigation measures will not be ready for a long period of time, this fact, of course, should also be recognized." Just because hunting and predation are outside of BLM jurisdiction does not mean that the analysis and subsequently identified mitigation are unnecessary or not required. How can BLM address all connected GRSG impacts and actions without analyzing predators and hunting effects and identifying proper mitigation? The full picture will not be answered and the analysis falls short in disclosing what can be done, holistically, to address GRSG conservation. It can be demonstrably argued that predation, previously identified as a USFWS-identified threat is a significant issue and that analysis of this issue is necessary to make a reasoned choice between alternatives, especially since the Nevada State Plan includes scientifically-based predator control. Predation and predator control are significant issues that should be analyzed.

1 1-12 2-3 While the resource topics of "Wildland Fire and Fire Management" and "Wild Horse and Burros" are suggested for dismissal from detailed analysis due to no potentially significant impacts from actions in this EIS, proper management of these two issues is still a top priority for local government. Further, an additional 10,000 horses have been born in Nevada, and over 1 million acres of wild land have burned since 2015 with additional impacts (not counting the ½ million + acres that have already burned this fire season). NACO recognizes the rationale provided here why additional analysis will not occur for Wild Horses and Burros (WHB). However, the provisions and management decisions related to WHB in the previous process have not been adhered to. The EIS should address this issue and be frank and propose real, actionable solutions to the WHB issue that were not identified in the previous EIS. The previous EIS failed to acknowledge that WHB remain on the public lands on a year-round basis and are not managed for the benefit of the rangeland resource that supports their very existence. Only their numbers are attempted to be controlled, but with minimal success. There typically are no rest periods for the range in HAs or HMAs, riparian areas nor wetland meadows. Numbers control is all that the BLM have available to them today to effectively manage horses, and Congress has again placed prohibition on how BLM can use funding to address excess on-range WHB. In addition, any attempts to restore rangelands to benefit GRSG within HMA's is improbable due to the restrictions that would be applied when attempting to protect a new seeding or defer use from an area for a period of time to allow for natural regeneration. Fencing and other structural improvements would also become a real challenge. Given the actual performance record of BLM and the exceedingly out-of-control numbers, how will the actual corrections be brought about that the previous EIS proposed? Beyond excuses for not having enough resources, what confidence can there be that BLM will not continue to practice the management process of "do as we say, not as we do"? BLM should not "target" the uses of public land that are easypicking without first addressing the mismanagement of the uses that are under the primary jurisdiction of the BLM itself. The BLM's failure to properly manage WHB has created a situation, in

many cases, where the burden is now on the other users of the land, primarily wildlife (including GRSG) and ranchers, to pay the price for BLM's shortfall. See County Needs Attachment

ES-3.3 ES-7 P 2, Bullet 8 We cannot understand with including "Recreation" under "resource topics dismissed from detailed analysis" given public land recreations direct link with access to public lands and the potential changes to Comprehensive Travel Management. At a minimum, this linkage should be acknowledged.

C.4.3 Habitat Boundary/ Habitat Management Area Designations

Modifying Habitat Management Area Designations The inflexible application of the habitat maps in the 2015 FEIS and Great Basin Region and Rocky Mountain Region Records of Decision ("RODs") was inappropriate because these landscape-scale maps have not been field-verified. As discussed in Section II. B., these landscape-scale maps are inconsistent with Congress' rejection of BLM's Planning 2.0 Rule and current Executive and Secretarial Orders that have revoked landscape-scale land use planning and mitigation policies. PGC is thus pleased that the 2018 DEIS recognizes the need for site-specific habitat data to inform land use decisions. We also strongly support BLM's proposal to use plan maintenance to incorporate new, on-the-ground habitat data rather than requiring a plan amendment.

PGC would like to embrace and emphasize the importance of BLM's acknowledgement that . . .the habitat management area designations (Figure 2-1b) do not constitute a land use plan decision but rather a landscape level reference of relative habitat suitability." (DEIS at 2-6). This is a key element of BLM' s Preferred Alternative that must be included in the Preferred Alternative in the FEIS. PGC recommends that the legend on the maps in Appendix A be modified to include a statement that site-specific, field-verified habitat data are required to make project-specific land use decisions and that these maps are not to be used to make site-specific land use decisions.

The 2018 FEIS and amended LUP should establish that Best Available Scientific Data comprised of site-specific, field-verified habitat maps are to be used in making project-specific land use decisions. Land use decisions that impose land use restrictions that impede or affect multiple uses including but not limited to lek buffer zones, seasonal and temporal travel restrictions, required design features, noise limits, and disturbance caps should be limited to areas with field-verified important habitat. Land use restrictions must not be based solely on landscape-scale habitat maps developed with remote sensing data and modeling. In the case of mineral exploration and development projects, land use restrictions must not interfere with claimants' rights to enter, occupy, and use the public lands for mineral purposes pursuant to the U.S. Mining Law. PGC's recommendation to base land use decisions on field-verified habitat data will improve the protection of actual and important GSG habitat while eliminating arbitrary and unnecessary restrictions on lands with less important habitat - or even no habitat. The use of field-verified habitat maps will insure that BLM's management of GSG habitat will focus on protecting the "best-of-the-best" habitat by applying appropriate land use restrictions and mitigation measures to address site-specific conditions. Using field-verified data will also ensure that any necessary restrictions and mitigation measures reflect the best way to protect important GSG habitat. Basing land use decisions on actual habitat conditions will ensure protection of priority habitat areas while reducing the broad and serious economic hardships to state and local governments, companies, and individuals who use public lands for mineral exploration and development, renewable and conventional energy development, grazing, hunting, guiding, recreation, and other uses.

The Management Alignment Alternative in the 2018 DEIS states that the habitat management maps would be refined and updated with new spatial and telemetry data every three to five years or when new data are incorporated into the model. (DEIS at 2-7). PGC suggests that BLM should continually refine the map with on-the-ground data that would help ground-truth the habitat model data. BLM should capitalize upon the site-specific GIS-based habitat baseline data that permit applicants provide in conjunction with their project proposals. For example, mineral exploration and development proposals submitted pursuant to the 43 CFR Subpart 3809 regulations typically include biological resources baseline studies that contain information on the presence or absence of GSG and GSG habitat. BLM typically uses these data in the NEPA analyses prepared to evaluate these proposals. The GIS-based habitat data collected by project proponents are valuable information that BLM should use to update and refine its habitat classification maps on a more regular basis than every three to five years.

The inflexible application of the habitat maps in the 2015 FEIS and Great Basin Region and Rocky Mountain Region Records of Decision ("RODs") was inappropriate because these landscape-scale maps have not been field-verified. As discussed in Section II. B., these landscape-scale maps are inconsistent with Congress' rejection of BLM's Planning 2.0 Rule and current Executive and Secretarial Orders that have revoked landscape-scale land use planning and mitigation policies. PGC is thus pleased that the 2018 DEIS recognizes the need for site-specific habitat data to inform land use decisions. We also strongly support BLM's proposal to use plan maintenance to incorporate new, on-the-ground habitat data rather than requiring a plan amendment. PGC would like to embrace and emphasize the importance of BLM's acknowledgement that . . .the habitat management area designations (Figure 2-1b) do not constitute a land use plan decision but rather a landscape level reference of relative habitat suitability." (DEIS at 2-6). This is a key element of BLM' s Preferred Alternative that must be included in the Preferred Alternative in the FEIS. PGC recommends that the legend on the maps in Appendix A be modified to include a statement that site-specific, field-verified habitat data are required to make project-specific land use decisions and that these maps are not to be used to make site-specific land use decisions. The 2018 FEIS and amended LUP should establish that Best Available Scientific Data comprised of site-specific, field-verified habitat maps are to be used in making project-specific land use decisions. Land use decisions that impose land use restrictions that impede or affect multiple uses including but not limited to lek buffer zones, seasonal and temporal travel restrictions, required design features, noise limits, and disturbance caps should be limited to areas with field-verified important habitat. Land use restrictions must not be based solely on landscape-scale habitat maps developed with remote sensing data and modeling. In the case of mineral exploration and development projects, land use restrictions must not interfere with claimants' rights to enter, occupy, and use the public lands for mineral purposes pursuant to the U.S. Mining Law. PGC's recommendation to base land use decisions on field-verified habitat data will improve the protection of actual and important GSG habitat while eliminating arbitrary and unnecessary restrictions on lands with less important habitat - or even no habitat. The use of field-verified habitat maps will insure that BLM's management of GSG habitat will focus on protecting the "best-of-the-best" habitat by applying appropriate land use restrictions and mitigation measures to address site-specific conditions. Using field-verified data will also ensure that any necessary restrictions and mitigation measures reflect the best way to protect important GSG habitat. Basing land use decisions on actual habitat conditions will ensure protection of priority habitat areas while reducing the broad and serious economic hardships to state and local governments, companies, and individuals who use public lands for mineral exploration and development, renewable and conventional energy development, grazing, hunting, guiding, recreation, and other uses. The Management Alignment Alternative in the 2018 DEIS states that the habitat management maps would be refined and

updated with new spatial and telemetry data every three to five years or when new data are incorporated into the model. (DEIS at 2-7). PGC suggests that BLM should continually refine the map with on-the-ground data that would help ground-truth the habitat model data. BLM should capitalize upon the site-specific GIS-based habitat baseline data that permit applicants provide in conjunction with their project proposals. For example, mineral exploration and development proposals submitted pursuant to the 43 CFR Subpart 3809 regulations typically include biological resources baseline studies that contain information on the presence or absence of GSG and GSG habitat. BLM typically uses these data in the NEPA analyses prepared to evaluate these proposals. The GIS-based habitat data collected by project proponents are valuable information that BLM should use to update and refine its habitat classification maps on a more regular basis than every three to five years.

The County is also concerned about BLM's use of the term "Habitat Management Areas" (HMA), which the County interprets as SGCMA, and the potential for future changes. Page 3 of the State Plan defines SGCMA as, the spatial extent of sage-grouse management in Nevada.

It is unclear to the County if the BLM will expand SGCMAs to match the Coates et al 2016 map, or if the BLM will adopt the State of Nevada SGCMAs (December 2015) and if those areas will change going forward. This clarification is critical to Churchill County as a large portion of the County (including nearly the entire Stillwater Mountains) is mapped by BLM (Figure 1-2a) and Coates et al 2016 as SGCMA (general or other habitat) while the State - adopted mapping (Figure 1-2b) does NOT included this area within the SGCMA.

Furthermore, the current State-adopted SGCMA (or the BLMs HMA if a definition is offered consistent with the State Plan) should be shown on each of these maps so that there is a better understanding of what is being proposed.

Under the Management Alignment Alternative, the NvMA supports the proposed methods to be used to better reflect the current state of science habitat mapping, and on the ground verification of the presence or absence of that habitat.

Protect sagebrush reserves. It is important, particularly in light of climate change, that land managers set aside areas both where sage-grouse are now and where they will need to go in the future; the current conservation plans fail to provide that direction.

Modifying Habitat Management Area Designations No-Action Alternative: The BLM's continued reliance on the same maps that it published in the previous LUPA process is highly flawed. These maps are based on analysis described in Coates et al 2014, which has since been updated (Coates et al 2016). Therefore, the use of the previously published maps does not meet the standard of utilizing the "best available science". In the document abstract, Coates et al 2016 specifically lists the updates that were made between 2014 and 2016, by stating: These updates include: (1) adding radio and GPS telemetry locations from sage-grouse monitored at multiple sites during 2014 to the original location dataset beginning in 1998; (2) integrating output from high resolution maps (1-2 rn2) of sagebrush and pinyon-juniper cover as covariates in resource selection models; (3) modifying the spatial extent of the analyses to match newly available vegetation layers; (4) explicit modeling of relative habitat suitability during three seasons (spring, summer, winter) that corresponded to critical life history periods for sage-grouse (breeding, broodrearing, over-wintering); (5) accounting for differences in habitat availability between more mesic sagebrush steppe communities in the northern part of the study area and drier Great Basin sagebrush in

more southerly regions by categorizing continuous region-wide surfaces of habitat suitability index (HSI) with independent locations falling within two hydrological zones; (6) integrating the three seasonal maps into a composite map of annual relative habitat suitability; (7) deriving updated land management categories based on previously determined cut-points for intersections of habitat suitability and an updated index of sage grouse abundance and space-use (A UI); and (8) masking urban footprints and major roadways out of the final map products. Given the above updates, the BLM should NOT rely on the Coates et al 2014 mapping data for any Alternative as it is clearly out of date. The County's concern with reliance on this out of date and incomplete mapping product is specifically with update #8 listed in Coates et al 2016. The BLM's current maps include: Cities (i.e. City of Winnemucca), Towns (i.e. Town of Eureka), Highways (i.e. US Highway 50), and important County Roads and existing infrastructure (i.e. Humboldt County Landfill). The allocation decisions associated with these flawed maps has resulted in direct harms and potential future harms to local government in its required administrative function and resulted in inconsistent implementation of the LUPA. Management Alignment Alternative: The BLM needs to better explain its alignment with State-approved maps for the overall perimeter of Sage-grouse Management Category Areas (SGMCA) as well as management area categories within that perimeter: PHMA, GHMA, and OHMA. Please keep in mind that SGMCA is defined on Page 10 of the Nevada State Plan as "The spatial extent of sage-grouse management in Nevada..." and SGMCAs were approved by the State through its Sagebrush Ecosystem Council (SEC) with technical input from the l, Nevada Division of Wildlife (NDOW) and the SEC's Technical Team (SETT). The management area categories within the SGMCA perimeter were developed by USGS (Coates et al 2016). The BLM should adopt the SGMCA mapping approved by the Nevada Sagebrush Ecosystem Council in December 2015. This mapping was developed utilizing the analysis completed and described by Coates et al 2016, including additional refinement by the scientific experts associated with NDOW and the SETT. The BLM should consult with both to better describe and document the refinements that were made between the Coates et al 2016 product and the maps adopted and dated December 2015.

The approach of ground-truthing is supported by both Coates et al 2014 and Coates et al 2016 in the following statements made in the Conclusion section: The power or plan amendment/revision, as appropriate of this approach rests within the map output that can be downscaled back to the local level that may help inform specific, "on the ground", habitat-management decisions. However it is important to recognize that leld data and other sources of information should be used in conjunction with inferences from this model. (Coates et al 2014) [emphasis added] Also, the County would emphasize the need to include two key factors in any mapping update: 1. Input from local government, including but not limited to: Counties, Conservation Districts and Local Area Work Groups (established specifically for local Sage-grouse Conservation Efforts); and, 2. Mapping updates should incorporate any new information derived from project specific ground-truthing and/or exemption decisions made since the last update. While the County supports the streamlined process for incorporating such updates through "plan maintenance", there may be occasion where such changes are warranted through a more formal plan amendment process. As such, Washoe County suggests incorporating language from the No-Action Alternative, that reads "Through plan maintenance or plan amendment/revision, as appropriate There should be a clear description of the conditions under which plan maintenance is appropriate for map revisions versus plan amendment/revision. For instance, Coates et al 2016 states: ...because only 6.5 and 8.5 percent area classified as habitat and management category changed between studies, the updated maps represent model refinements based on better input data rather than a complete mapping overhaul, (page 18) [emphasis added]

When making project and mitigation decisions, Primary Habitat management Areas (PHMA) and GHMA must be considered a functional unit as connectivity through GHMA is key to PHMA populations.

However, as described in Table-2-2, this habitat assessment process will be used only to inform criteria (i) under the Allocation Exception process. The process should be used to inform all environmental analysis of all proposed projects, including locatable mineral projects under 43 C.F.R. Subpart 3809. Without a process for evaluating and, if necessary, correcting habitat classification at the project-specific level, BLM's environmental analysis, including NEPA documents could be incorrect.

BLM Should Use Accurate, Site-Specific Data to Support Habitat Designations and Project Level Decisions The 2015 LUPA decision was flawed because the habitat designations ere overbroad and based on limited or incorrect data.

The Federal District Court for the District of Nevada has directed BLM to perform supplemental NEPA analysis to correct and evaluate habitat designations. Western Exploration, LLC v. U.S. Dept of Interior, 250 F. Supp. 3d 718, 750-751 (D. Nev. 2017). In its rush to meet the September, 2015 deadline associated with settlement of a separate lawsuit over listing of the greater sage-grouse, BLM failed to adequately and accurately define sage-grouse habitat designations that were central to the land use restrictions and management directions. Habitat designations are based on large scale maps where thousands or even millions of acres are subjected to land management restrictions without any supporting data that the land that may be restricted is actually sage-grouse habitat.

The ARMPA also failed to include measures to efficiently and expeditiously correct errors in habitat mapping or to allow proponents of project level decisions to provide site-specific data to correct or clarify habitat designations. The ARMPA also fails to allow BLM to consider site-specific data which shows areas of non-habitat within GHMA or PHMA when making impact determinations or assessing mitigation needs.

The habitat mapping issue directly affects the Thacker Pass project. BLM lands near Thacker Pass are categorized as PHMA, but site surveys have shown that much of the land proposed to be disturbed by the project is dominated by cheat grass, or where sagebrush is present it is diseased or dying and without adequate understory to provide sage-grouse habitat. Repeated surveys have shown no sage-grouse use in the area. In fact, it is clear from the site conditions that better habitat is available north of and above (in elevation) the Thacker Pass site and that sage-grouse in the area use those areas to the exclusion of the Thacker Pass lands. LNC has commissioned numerous studies and surveys to document local habitat conditions, but under the terms of the ARMPA, BLM has ignored relevant site specific data in favor of the large scale habitat maps. This error has significant, on-the-ground implications for sage-grouse conservation. LNC is currently developing a mine plan, including locations for ancillary facilities such as a processing facility, tailings storage facility and waste rock dump, to support the extraction of lithium. Under the current plan (and the proposed revision) such facilities should avoid or minimize impacts to mapped PHMA and GHMA to the extent practicable. When the maps are not correct, this guidance is also incorrect. Incorrect maps also lead to incorrect assessment of impacts to habitat. BLM has partially addressed this issue in the Draft EIS by 1) adopting the updated maps, 2) providing additional flexibility for habitat management designations, and 3) identifying a classification correction process in the Allocation Exception Process. DEIS pages 2-7 and 2-12. Unfortunately, these measures are incomplete-the mapping errors near the Thacker Pass project remain in the updated maps and the correction measures in the Allocation Exception Process do not apply to locatable mineral proposals.

The revised language for MD SSS 17 (habitat management area designation flexibility) includes review and refinement only every 3 to 5 years or "when new data are incorporated into the model." BLM should adopt a specific provision in the revised plan that allows the agency to modify the habitat maps for PHMA and GHMA based on site-specific data gathered in connection with a proposed action or environmental analysis if that data shows that the lands in question do not meet applicable criteria to be classified as PHMA or GHMA. In other words, there should be flexibility to revise the habitat management area designation at the project review level.

The Commenter supports the laudable purposes of flexibility for adjustment of HMAs without the need for a plan amendment. The issue is how to define the outer reaches of "plan maintenance" from material changes that would warrant the formality of land use plan amendments under FLPMA. The DEIS Management Alignment Alternative proposes to update and make adjustment to HMAs and include language that would allow the BLM to update the HMAs through plan maintenance "when appropriate, based on the most updated best available science." Such efforts to reflect the accurate habitat on the ground would serve the laudable purpose of allowing infrastructure and economic development to occur in areas that would not impact the species. See Nevada DEIS at ES-9.

The Clark Project HMAs Can Be Removed Pursuant to Plan Maintenance The Clark Project suffers from I-IMA designations that are clearly in error, the first being the split HMA designations over the Project's active mine site, (Figures 1 and 2, above), and the second being an I-IMA designation through a tidy, precise "spike" cutting through the heart of a significant access roads to serve the Project's critical transportation infrastructure. (Figure 4). Such I-IMA designations were as patently incorrect as the landfill designated as PI-IMA and rejected by the Nevada Federal District Court in Western Exploration, et al. v. U.S. Department ofthe Interior, and need to be remedied immediately. 43 CFR § 1610.5-4 requires plan maintenance "as necessary," and in the case of the Clark Project, such re-designation is critically "necessary." Figure 4. "Spike" designation GHMA/OHMA bisecting essential Clark Project transportation and operational infrastructure. As applied to the Clark Project, I-IMA designations that are clearly erroneous and void ab initio. They fail to qualify under any HMA criteria because the Clark active mine site fails to support Fifteen "areas of occupied seasonal or year-round habitat outside of [priority habitat management areas]," (GHMA), or lands that "contain seasonal or connectivity habitat areas," (OHMA). Nevada and Northeastern California Greater Sage-Grouse ARMPA at 1-6. Accordingly, HMA re-designation is appropriate through plain maintenance: Here, where the HMA descriptions on the Clark Site are blatantly incongruous with the physical land mass chosen to support the habitat designation, plan maintenance in this case perfectly aligns with other examples of maintenance actions grounded in science, including "refining the known habitat of a special status species" as pointed to in the BLM Handbook.

An important concept reasonably developed by the courts in an ESA context-important here because the purpose and need of the current land use plan amendments are designed to advance ESA interests to avoid treatment under the ESA of the GRSG-is found in critical habitat jurisprudence. With respect to HMA designations that arguably fit with the quantity and quality of performance expected from such a designation, the question arises as to flexibility of project operations within appropriately-designated habitat management areas. Judicial review of destruction or adverse modification of critical habitat is instructive to provide a test for operational flexibility in appropriately-designated HMAs. Assuming that PHMA is an arguable analogue to designated critical habitat for listed species, the courts instruct that, in the context of Section 7 consultation, a proposed Federal action that might destroy or adversely modify

designated critical habitat is allowable under the ESA, provided: (l) The affected area is insignificant relative to the total designated critical habitat; (2) The localized effects are fully discussed; and (3) The use of large-scale analysis does not mask multiple site specific effects that pose a significant risk to the species when considered in the aggregate. see Rock Creek Alliance v. U.s. Forest Service, 703 F.Supp.2d 1152, 1 198 (D. Mont. 2010). See also Butte Envíl. Council v. U.S. Army Corps of Eng 'rss, 620 F.3d 936, 947-48 (9th Cir. 2010) (holding that FWS's determination that critical habitat would be destroyed was thus not inconsistent with its finding of no 'adverse modification' because the project would affect only a very small percentage of each affected species' critical habitat). In evaluating the prospect for flexible operations within designated habitat management areas for GRSG, a similar test could be developed by BLM as is utilized for destruction or adverse modification of critical habitat. To provide for operational flexibility in correctly-designated Sixteen HMAs, the overall range of he GRSG must be considered with respect to flexibility for site specific activities. To the degree that the functionality and scale of the impacts on HMAs will not lead to overall impairment of the habitat, operational flexibility within HMAs will certainly be appropriate given what the Federal courts have provided with respect to review of proposed actions that unquestionably degrade designated critical habitat. The Commenter does not concede that any operational flexibility is needed in the HMA designations on the Clark Project Site because both GHMA and OHMA were incorrectly designated in the first instance, are void ab initio, and should be re-designated as soon as possible through plan maintenance. So stated, any delay in HMA re-designation stands to potentially impact the certainty of EPM's business model, as an amendment to the plan of operation requested by EPM was withdrawn as a direct result of the mis-designated 'HMAs on the Clark Site. Should there be any uncertainty about the illegitimacy as to the GHMA/OHMA designations on the Clark Project Site, for purposes of immediate relief, it can safely be represented that no arguable function of the HMAs in place at Clark satisfy the criteria of any GRSG occupation seasonal or otherwise - or lend themselves to GRSG population connectivity. Further, the acreage at issue at the Clark Project is insignificant relative to the total I-IMAs designated in Nevada and across the complete GRSG range. Accordingly, eliminating the HMA designations on the Clark Site remains a comfortable fit for plan maintenance.

EPM fully supports the opportunity proposed in the Management Alignment Alternative to provide exceptions and stipulations which run concurrently with the PHMA, GHMA and OHMA designations, respectively. As discussed earlier, the Clark Project presently suffers from misdesignated HMAs in the first instance, which for purposes of these comments, presume to be originally designated in clear error, as were other HMA designations before the United States District Court. And to reaffirm, the position of the Commenter is that such original designations are void ab initio. So stated, EPM supports the proposed allocation exception process as applied to its Clark operations for the fòllowing reasons: 1. As earlier described, the GHMA allocations imposed on the Clark Project are unsuitable in the first instance and meet the criteria of lacking the ecological potential to become marginal or suitable habitat for GRSG. Additionally, redesignating GHMA on Clark will not result in direct, indirect, or cumulative impacts on GRSG and its habitat, and thus meets criteria (i) as set forth in Section 2.5 at 2-12. Seventeen In further analysis of the allocation exception criteria, (ii) is inapplicable to the HMA allocations on the Clark Project site due to their original mi ss-designation and unsuitability as discussed above. Addressing (iii), the "spike" GHMA designation effectively cuts off project infrastructure and thus meets criteria (iii) as being necessary to "address public health and safety concerns" related to central transportation corridors on the project site. This complements criteria (iv) as being required to re-authorize existing infrastructure and having no impact whatsoever on GRSG and its habitats. See also (v), as also being required to serve "existing infrastructure (i.e., rights-of-way for roads) that serve ... a

public purpose." See Nevada DEIS, Section 2.5 at 2-13. 2. To the degree that the habitat management area designations flexibility component to the Nevada DEIS includes review and refinement every three to five years for mapping, the mis-designated HMA can be appropriately addressed through plan maintenance. As noted in the particularly conspicuous misdesignation of the Clark Project's active mine site as including consideration of habitat suitability to inform refinement and adjustment of I-IMA boundaries, this process comfortably accommodates lifting HMA designations inappropriately imposed in the first instance through plan maintenance activity. Accordingly, for the Clark Project site, the triggering of the allocation exception process is unnecessary. Should the proposed allocation exception process be necessary for the HMA mis-designations on the Clark Project site, as noted above, such exceptions to the HMA designations are appropriate for elimination altogether under several criteria proposed in the Nevada DEIS.

A Significant Aspect of the PLUPA, as applied to the Protestant, is Based upon Invalid or Incomplete Information In the PLUPA/FEIS, it appears that a certain part of the Clark Project on BLM land is proposed to be bisected and designated as a General Habitat Management Area (GHMA) and Other Habitat Management Area (OHMA). Even though the BLM portion of the Project is wholly disconnected from broader and more significant GRSG habitat to the north, the portion of the Clark Project designated as GHMA s,vas also designated as a travel and transportation limited area, (See map attached as Attachment A.) Additionally, from what the Protestant can ascertain, a spike of Federal land designated as GHMA splits the project site, and due to travel restrictions, appears to have cut off a key transportation corridor between parts of the Project site, see also Attachment A. Finally, the portion of BLM land incorporated located on the Project sitc was - only several months ago designated for disposal by BLM in a draft RMP document, only to be subsequently designated CJHMA and OMMA in the instant PLUPMFEIS. see Draft Resource Management Plan and Environmental Impact Statement, Bureau of Land Management, Carson City District, Nevada (November 2014) Volume 4 Appendix A, Figures 2-70, 2-71, 2-73.

In the Draft EIS, BLM erroneously suggests that PHMA and GHMA are not actually land use plan decisions, but are instead something far less consequential - "a landscape level reference of relative habitat suitability." NV/CA Draft EIS at 2-6. What this phrase means is not at all clear. But it does create unnecessary confusion and uncertainty concerning the legal effect of habitat designations. BLM must clarify that habitat designations are, in fact, land use plan decisions. Moreover, the habitat designations are the most important decisions included in the plan because they dictate where land use allocations and stipulations apply for activities that could harm Greater sage-grouse, including energy development, grazing, and mining. FLPMA identifies a range of decisions that BLM must incorporate into land use plans, including "[l]and areas for limited, restricted or exclusive use; designation, including ACEC designation. . . ." 43 C.F.R. § 1601.0-5(n)(1). BLM's land use planning handbook also lists "special designations" as a type of "land use plan decisions." H-1601-1 at App. C-1. Further, it is apparent that, in the 2015 ARMPA, BLM viewed habitat designations as a crucial land use plan decision that "protect the most important GRSG habitat areas" and "identify the management decisions that apply to those areas. . . ." ROD and ARMPAs for the Great Basin GRSG Sub-Regions at 1-14; see also NV/CA ARMPA at 1-4 ("GRSG habitat on BLM-administered lands in the decision area consists of lands allocated as priority habitat management areas (PHMA), general habitat management areas (GHMA), and other habitat management areas. . . ."). Finally, FWS's 2015 "not warranted" determination is predicated on the designation and ongoing protection of habitat management areas, stating: The Federal Plans provide clear management regulations with measurable objectives to address invasive annual grasses, conifer encroachment,

improper grazing, and free roaming equids. They prioritize management in the most important habitat (PHMA), which encompasses approximately 60 percent of the breeding habitat in the Great Basin. All forms of development-from energy, infrastructure, and grazing structures- would be avoided in PHMA unless further assessment found the project not to have any adverse effects on the species. 80 Fed. Reg. at 59,940-941. In short, any attempt by BLM to water-down the legal effect of the habitat designations could have serious consequences for Greater Sage-grouse and the ongoing validity of FWS's "not warranted" determination. In the final plan amendment, BLM must strike the characterization of the habitat designations included on page 2-6 and reinforce that those designations are land use plan decisions that BLM is committed to upholding and enforcing.

BLM must involve the public prior to updating habitat management area maps and designations. BLM must commit to involving the public in any and all future changes to habitat management area maps. The Draft EIS lacks such a commitment, and would allow BLM to make unlimited changes to the maps through plan maintenance (as opposed to the 2015 RMP, which directs BLM to also employ amendments and revisions, "as appropriate"). NV/CA Draft EIS at 2-7. First, BLM must not use plan maintenance for updating habitat maps in all circumstances, as proposed in the Draft EIS. The cumulative effect of making unlimited habitat boundary changes across Nevada could dramatically reduce the acreage totals for PHMA and GHMA, particularly in concert with other changes proposed in the Draft EIS, such as the "allocation exception process." Changes of this nature would not be "minor," because they would "result in expansion in the scope of resource uses … of the approved plan." 43 CFR §1610.5-4. Therefore, they would not be suitable for plan maintenance under BLM's regulations. BLM must instead continue to recognize that plan revisions/amendment may be necessary to update habitat maps - such as when greater than 3 percent of the habitat area polygon would be reduced -- - and clearly define the circumstances that would justify the use of plan maintenance. Second, even where plan maintenance is appropriate, BLM should still provide the public with the opportunity to review and comment on proposed changes to habitat maps. BLM's land use planning handbook does not foreclose public engagement around plan maintenance efforts. While the Draft EIS states that "other stakeholders would be encouraged to participate in the process by submitting relevant information to the listed agencies", id. at 2-7, if the habitat maps are changed through plan "maintenance" - with no public notice - the only participants who will know about that process will be the proponents of a project. If BLM opens the process to "other stakeholders," that process must be open for all stakeholders (through notice-and-comment for those stakeholders), not just for project proponents. Thus, given the widespread interest in sage-grouse conservation and to ensure that the public is fully aware of changes to the habitat maps, BLM should provide for public engagement opportunities when updating habitat maps through plan maintenance. In sum, while we fully support the use of the most up-to-date scientific data to define habitat boundaries, any changes to those boundaries must be made through a public process. Further, those changes must only be made because of new habitat data, and not to streamline the approval process for specific projects or activities.

Chapter 4.7.2 Impacts of Management Alignment Alternative (Page 4-14) This section describes the net loss of over one million acres of Habitat Management Areas including the loss of 44,000 acres of the highest quality available habitat (PHMA) as a minor action. Describing this quantity of land as minor is subjective and therefore inappropriate. This is especially true given that the Management Alignment Alternative plans to gut SFA designations and their associated protections. Sufficient data to show that the amount of land no longer needs to be managed for this species is not included within this DEIS. A

decision to change or remove management designations should be as transparent as possible. No process to change the designations was included within the Management Alignment Alternative.

With respect to HMA designations that arguably fit with the quantity and quality of performance expected from such a designation, the question arises as to flexibility of project operations within appropriately designated HMAs. Judicial review of destruction or adverse modification of critical habitat is instructive to provide a test for operational flexibility in appropriately designated HMAs. Assuming that PHMA is an arguable analogue to designated critical habitat for listed species, the courts instruct that, in the Page Twenty-Two context of Section 7 consultation, a proposed Federal action that might destroy or adversely modify designated critical habitat is allowable under the ESA, provided: 1) The affected area is insignificant relative to the total designated critical habitat; 2) The localized effects are fully discussed; and 3) The use of large-scale analysis does not mask multiple site-specific effects that pose a significant risk to the species when considered in the aggregate. Rock Creek Alliance v. U.S. Forest Service, 703 F.Supp.2d 1152, 1198 (D. Mont. 2010). See also Butte Envtl. Council v. U.S. Army Corps of Eng'rs, 620 F.3d 936, 947-48 (9th Cir. 2010) (FWS's determination that critical habitat would be destroyed was thus not inconsistent with its finding of no "adverse modification" because the project would affect only a very small percentage of each affected species' critical habitat.) In evaluating the prospect for flexible operations within designated habitat management areas for GRSG, a similar test could be developed by the BLM as is utilized for destruction or adverse modification of critical habitat. To provide for operational flexibility in correctly designated HMAs, the overall range of the GRSG must be considered with respect to flexibility for site specific activities. To the degree that the functionality and scale of the impacts on HMAs will not lead to overall impairment of the habitat, operational flexibility within HMAs will certainly be appropriate given what the Federal courts have provided with respect to review of proposed actions that unquestionably degrade designated critical habitat.

We recommend that the Final EIS for the Greater Sage Grouse RMPA include an update on the status of those PEISs and disclose whether or not they have the potential to result in any changes to Habitat Management Area designations.

While non-SFA habitat designations will remain in place, these designations will be essentially meaningless as the agency can waive the outlined stipulations for these areas based on any one of six broadly worded (and sure to be broadly interpreted) criteria. Indeed, the amendments seem to be specifically written in a way that the acreage of each habitat management area will decline over time given the ease that restrictions are waived and the language that allows for regular adjustments to management area boundaries without additional public scoping or comment.

Under Alternative B, LCPD will have had the opportunity to examine the local habitat along proposed projects to determine if suitable greater sage-grouse habitat is actually present or not, rather than relying on maps intended for a much larger scale. From Table 2-2 of the RMPA/EIS: When a proposed project is thought to be in an area that is unsuitable for Greater Sage-Grouse within PHMA, GHMA, and/or OHMA [Other Habitat Management Area], habitat assessments of the project site and its surrounding areas would be conducted by a qualified biologist with Greater Sage-Grouse experience using BLM-approved methods based on Stiver et al. 2015 and compliant with current BLM Policy, to identify suitable, marginal, or unsuitable Greater Sage-Grouse habitats at multiple scales.

Language should be added tying these determinations and decisions to qualified people using acceptable methods. Even though GHMA is not PHMA, metapopulation dynamics will rely heavily on connectivity

through GHMA, thus it needs to be clear that these projects will not just be "waved" through because it is GHMA.

The SETT recommends that the BLM works in cooperation with the rights-of-way holders to conduct maintenance, in addition to operation activities authorized under an approved ROW grant, in a way that avoids and minimizes effects on sage-grouse and their habitat.

Modifying Habitat Management Area Designations: The County does NOT support the "No Action Alternative" for the following reasons. The U.S. District Court for the District of Nevada recognized Humboldt County's standing in the Sagegrouse Lawsuit, and the harms to the County from the NEPA violation and errors in the decision and mapping, due in part to the County's Regional Landfill that is erroneously designated as being situated in the middle of Sage-grouse habitat. In addition, the erroneous mapping in the Record of Decision ("ROD") for the BLM's 2015 Nevada and Northeastern California Greater Sage-grouse Land Use Plan (2015 1-UP) shows the City of Winnemucca as falling within Sagegrouse habitat. Finally, the County has great concern for cascading negative impacts due to incorrect habitat management area designations on important land uses. Such important public land uses include but are not limited to: transportation and travel management, county administrative access, maintenance of existing county infrastructure (i.e. roads), renewable energy development, ranching, recreation, mineral exploration and development, and important utility rights-of-way.

The County supports the "Management Alignment Alternative" with several suggested clarifications. The County supports utilizing the 2015 State-adopted maps as an initial starting point. However, the BLM needs to acknowledge, in the DEIS, that the maps were derived from a modeling exercise. As such, areas mapped as "priority, general, or other habitat" may actually include areas of non-habitat and/or non-use by Sage-grouse. The BLM must allow provisions for ground-truthing of habitat before making a final decision on allocation decisions and/or mitigation requirements for a given project. The BLM must also realize that habitat areas could change and shift as new and more information (i.e. Sage-grouse collar data, updated lek data, etc.) becomes available.

[comment:67-8; 105.0301]e propose that an adjustment (adding or subtracting acreage) comprising not more than 3% of an existing polygon would qualify as appropriate for a maintenance action.For larger adjustments, NEPA and BLM planning rules and procedures should apply, requiring a plan amendment and public engagement, as well as the following provisions, before any adjustment of habitat management boundaries:? Federal, state, and local agencies, and other interested stakeholders, should have the opportunity to participate.? There should be public notice of proposed changes, and an opportunity for the public to comment.? Adjustments should be based on the best available, science-based information,including all applicable peer-reviewed research papers.Review of boundaries would occur every five years, unless more frequent adjustments are necessary, as determined by BLM and the relevant state agency? Boundaries would generally not be adjusted to exclude non-habitat areas if those areas are wholly contained within existing management boundaries.? Areas within habitat management boundaries not currently used by sage-grouse but ecologically capable of supporting sage-grouse would not be removed from existing management boundaries. 78[comment end]

Do a better job of protecting Priority Habitat Management Areas by reducing oil/gas development impacts. New development should be prioritized outside these important population areas and strong buffers maintained around sage-grouse leks.

we support the Management Alignment Alternative for modifying habitat management areas

ES-5 ES-9 Table ES-4, Management Alignment Alternative This column states that As the boundaries are updated, the allocations associated with each Habitat Management Area (Table 2-1 in Chapter 2) would be adjusted to match the newest Habitat Management Area boundaries (Coates et al. 2016). However, Coates et al. 2016 didn't adopt the Sage-grouse Management Area (SGMA) boundaries, the State of Nevada did when it approved its Habitat Management Category Mapping in December 2015. Is the BLM suggesting that the SGMA boundaries will change, or the habitat classifications (priority, general and other) within the SGMAs, or both? NACO would advocate for maintaining the SGMA boundaries since those have been previously set and approved by the State, and then updating the categories within the boundaries as appropriate. This clarification must be made to provide consistent mapping that has alignment between the State, BLM and USGS (Coates et al) mapping products.

2 2-6 Table 2-2, Issue 1, Modifying Habitat Management Area Designations Sub-issue 1, Conform to management No-Action Alternative: The BLMs continued reliance on the same maps that it published in the previous LUPA process is highly flawed. These maps are based on analysis described in Coates et al 2014, which has since been updated (Coates et al 2016). Therefore, the use of the previously published maps does not meet the standard of utilizing the "best available science". In the document abstract, Coates et al 2016 specifically lists the updates that were made between 2014 and 2016, by stating: These updates include: (1) adding radio and GPS telemetry locations from sage-grouse monitored at multiple sites during 2014 to the original location dataset beginning in 1998; (2) integrating output from high resolution maps (1-2 m2) of sagebrush and pinyon-juniper cover as covariates in resource selection models; (3) modifying the spatial extent of the analyses to match newly available vegetation layers; (4) explicit modeling of relative areas identified by the States habitat suitability during three seasons (spring, summer, winter) that corresponded to critical life history periods for sage-grouse (breeding, brood-rearing, over-wintering); (5) accounting for differences in habitat availability between more mesic sagebrush steppe communities in the northern part of the study area and drier Great Basin sagebrush in more southerly regions by categorizing continuous region-wide surfaces of habitat suitability index (HSI) with independent locations falling within two hydrological zones; (6) integrating the three seasonal maps into a composite map of annual relative habitat suitability; (7) deriving updated land management categories based on previously determined cut-points for intersections of habitat suitability and an updated index of sage grouse abundance and space-use (AUI); and (8) masking urban footprints and major roadways out of the final map products. Given the above updates, the BLM should NOT rely on the Coates et al 2014 mapping data for any Alternative as it is clearly out of date. NACOs concern with reliance on this out of date and incomplete mapping product is specifically with update #8 listed in Coates et al 2016. The BLMs current maps include: Cities (i.e. City of Winnemucca), Towns (i.e. Town of Eureka), Highways (i.e. US Highway 50), and important County Roads and existing infrastructure (i.e. Humboldt County Landfill). The allocation decisions associated with these flawed maps has resulted in direct harms and potential future harms to local government in its required administrative function and resulted in inconsistent implementation of the LUPA. Management Alignment Alternative: The BLM needs to better explain its alignment with State approved maps for the overall perimeter of Sage-grouse Management Category Areas (SGMCA) as well as management area categories within that perimeter: PHMA, GHMA, and OHMA. Please keep in mind that SGMCA is defined on Page 10 of the State Plan as "The spatial extent of sage grouse management in Nevada…" and SGMCAs were approved by the State through its Sagebrush Ecosystem Council with technical input from NDOW and the SETT. The management area categories within the SGMCA perimeter were developed by USGS (Coates et al

2016). The BLM should adopt the SGMCA mapping approved by the Nevada Sagebrush Ecosystem Council in December 2015. This mapping was developed utilizing the analysis completed and described by Coates et al 2016, including additional refinement by the scientific experts associated with the Nevada Department of Wildlife and the Nevada Sagebrush Ecosystem Technical Team. The BLM should consult with both to better describe and document the refinements that were made between the Coates et al 2016 product and the maps adopted and dated December 2015.

2 2-7 Table 2-2, Issue 1, Modifying Habitat Management Area Designations Sub-issue 2, Habitat management area designations flexibility No-Action Alternative: Once again, NACO would stress that this alternative's reliance on Coates et al 2014 relies on outdated information, and not "best available science" as described in the above comments. Management Alignment Alternative: NACO generally supports this approach, and would emphasize the need to include two key factors in any mapping update: 1. Input from local government, including but not limited to: Counties, Conservation Districts and Local Area Work Groups (established specifically for local Sage-grouse Conservation Efforts); and, 2. Mapping updates should incorporate any new information derived from project-specific ground-truthing and/or exemption decisions made since the last update. While NACO supports the streamlined process for incorporating such updates through "plan maintenance", there may be occasion where such changes are warranted through a more formal plan amendment process. As such, NACO suggests incorporating language from No-Action Alternative, that reads "Through plan maintenance or plan amendment/revision, as appropriate…". There should be a clear description of the conditions under which plan maintenance is appropriate for map revisions versus plan amendment/revision. For instance, Coates et al 2016 states, because only 6.5 and 8.5 percent area classified as habitat and management category changed between studies, the updated maps represent model refinements base on better input data rather than a complete mapping overhaul. (page 18) [Emphasis added] To address these comments, please revise the language in the second paragraph to read "The review and refinement process would be scientifically based and occur through the Nevada Sagebrush Ecosystem Program process which would include review and input from the SETT, NDOW, BLM, USFS, and USFWS and local government agencies, especially related to local knowledge, and approval from the SEC." Add "when appropriate" to read "…through plan maintenance, when appropriate." It should also be clear that BLM is not pre-decisional in that every change in the management designations would be through plan maintenance; BLM must leave room for changes be made through a plan amendment when necessary (and plan maintenance is not appropriate).

Why does Management Alignment Alternative only allow potential exceptions to PHMA and GHMA? Please add OHMA as well.

Appendix A Figure 1-2a Apply to all similar maps: Please map the overall Habitat Management Area (HMA), assumed to be the overall extent (perimeter) of Habitat Area, for sake of clarity. Appendix A Figure 1-2b Apply to all similar maps: Please map the overall Habitat Management Area (HMA) for sake of clarity. This should match the Sage-grouse Management Area (SGMA) now referred to as the Sagegrouse Management Category Area (SGCMA), or spatial extent (overall perimeter) of GRSG management in Nevada, as adopted by the Sagebrush Ecosystem Council in December 2015. Appendix A Figure 2-2a It should be noted that there is mapped habitat from Figure 1-2a that falls outside of the BSUs and Lek Clusters. Appendix A Figure 2-2b It should be noted that portions of the updated BSUs and Lek Clusters fall outside of the HMA (BLM) or SGCMA (Nevada Plan). The HMA/SGCMA boundary should be added to this map to better illustrate this issue. Appendix A Figures 2-3b to 2-13b All

"Allocation Specific Maps" under the Management Alignment Alternative should include a note under any mapped allocation restriction (i.e. closed, exclusion, avoidance, retention, limited, etc.) that such allocations restrictions are subject to ground-truthing of mapped / modeled habitat as well as the exception process.

The amended plans should do all they can to protect sage-grouse habitat across the west, including keeping key commitments to protect the most important habitat

WMC recommends that the legend on the maps in Appendix A be modified to include a statement that site-specific, field-verified habitat data are required to make project-specific land use decisions and that these maps are not to be used to make site-specific land use decisions. The 2018 FEIS and amended LUP should establish that Best Available Scientific Data comprised of site-specific, field-verified habitat maps are to be used in making project-specific land use decisions. Land use decisions that impose land use restrictions that impede or affect multiple uses including but not limited to lek buffer zones, seasonal and temporal travel restrictions, required design features, noise limits, and disturbance caps should be limited to areas with field-verified important habitat. Land use restrictions must not be based solely on landscape-scale habitat maps developed with remote sensing data and modeling. In the case of mineral exploration and development projects, land use restrictions must not interfere with claimants' rights to enter, occupy, and use the public lands for mineral purposes pursuant to the U.S. Mining Law. WMC's recommendation to base land use decisions on field-verified habitat data will improve the protection of actual and important GSG habitat while eliminating arbitrary and unnecessary restrictions on lands with less important habitat - or even no habitat. The use of field-verified habitat maps will insure that BLM's management of GSG habitat will focus on protecting the "best-of-the-best" habitat by applying appropriate land use restrictions and mitigation measures to address site-specific conditions. Using field-verified data will also ensure that any necessary restrictions and mitigation measures reflect the best way to protect important GSG habitat. Basing land use decisions on actual habitat conditions will ensure protection of priority habitat areas while reducing the broad and serious economic hardships to state and local governments, companies, and individuals who use public lands for mineral exploration and development, renewable and conventional energy development, grazing, hunting, guiding, recreation, and other uses. The Management Alignment Alternative in the 2018 DEIS states that the habitat management maps would be refined and updated with new spatial and telemetry data every three to five years or when new data are incorporated into the model. (DEIS at 2-7). WMC suggests that BLM should continually refine the map with on-the-ground data that would help ground-truth the habitat model data. BLM should capitalize upon the site-specific GIS-based habitat baseline data that permit applicants provide in conjunction with their project proposals. For example, mineral exploration and development proposals submitted pursuant to the 43 CFR Subpart 3809 regulations typically include biological resources baseline studies that contain information on the presence or absence of GSG and GSG habitat. BLM typically uses these data in the NEPA analyses prepared to evaluate these proposals. The GIS-based habitat data collected by project proponents are valuable information that BLM should use to update and refine its habitat classification maps on a more regular basis than every three to five years.

WMC is concerned that the Allocation Exception Process is too narrow and rigid to give BLM the necessary flexibility to use best available science (e.g., field-verified habitat data) and to make project-specific decisions in GSG habitat based on actual, field-verified habitat data. The allocation exception process needs to state clearly that one of the circumstances which always requires an allocation exception is when a project applicant provides on-the-ground habitat data collected by a qualified

biologist using BLM-approved data collection protocols that documents different habitat conditions than on Figure 1-2b. BLM should be required to base project decisions on actual field-verified habitat conditions rather than on the habitat management classifications shown on Figure 2-1b. Therefore, whenever BLM has field-verified habitat data that have been provided by a project proponent, the State of Nevada, or otherwise obtained by BLM, BLM must use this information in making land use decisions. In these circumstances, the landscape management area classification map (e.g., Figure 2-1b) cannot be used as the basis for BLM's decision. The restrictions that apply to the PHMA management classification must not be required on lands that are GHMA, OHMA, or non-habitat based on field-verified habitat conditions. Similarly, the restrictions that apply to GHMA must not be required on lands that are OHMA or non-habitat based on field-verified habitat conditions. Because BLM is compelled to use best available science, granting an allocation exception should be the standard operating procedure that does not require the State Director's authorization. BLM District Managers should be authorized to grant allocation exceptions whenever BLM is provided with field-verified habitat data that conflicts with Figure 2-1b. As stated elsewhere, the land use restrictions in the amended 2018 GSG LUP cannot substantially interfere with a claimant's rights under the U.S. Mining Law including the rights of ingress and egress, and reasonable use and occupancy for mineral exploration and development purposes. The following discussion of the Allocation Exception Process as presented in Table 2-2 is poorly worded and confusing: "Verify use of landscape-scale mapping of PHMA, GHMA, and OHMA in regards to the application of allocations and stipulations." (DEIS at ES-3 and 2-12). As written, this appears to contradict the DEIS provisions pertaining to modifying habitat management area designations based on field-verified habitat data and diminish or even eliminate the need for an exception process. To make the allocation exception process consistent with the procedures outline to modify habitat management area designations WMC suggests this sentence needs to be rewritten to say: "Use field-verified habitat data whenever available to make project-specific decisions and to apply allocation exceptions and stipulations." Similarly, the sentence on Table 2- 2 stating "In PHMA and GHMA, the State Director may grant an exception to the allocations and stipulations described in Section 2-5 if one of the following applies…" is circular and confusing because Table 2-2 is the only content in Section 2.5.

The BLM's Record of Decision ("ROD") and Approved 2015 Resource Management Plan Amendments ("ARMPAs") stated that the plans "were developed to address specific, identified threats to the species" and that with the objective of protecting the "most important" GSG habitat areas, "planning began with mapping areas of important habitat" across the range. While Coeur supports the objective, unfortunately, the mapping process was fundamentally flawed which resulted in arbitrary designation of previously disturbed and sometimes already developed lands as "priority" habitat management area (PHMA) designated for protection and extreme management restrictions. Moreover, significant changes in the final EIS included erroneous mapping information that may have an unwarranted effect to Coeur if used to implement restrictions on current or future exploration or development operations in Nevada. For example, as the Nevada Federal Court recognized, the final EIS turned 75,100 acres of non-habitat into PHMA - a status requiring the highest level of protection and reserved for what was purportedly the best greater sage-grouse habitat, and 21,611 acres identified in the draft EIS as non-habitat into SFA which is purportedly the "best of the best" and results in absolute prohibitions of certain uses. Particular lands that were not subject to any management restrictions because they were non-habitat in the draft EIS suddenly became encumbered with the most extreme management decisions in the final plan amendments which the Nevada Federal Court found "did not allow for intelligent public participation in the EIS process." The Nevada Division of Wildlife, the agency with primary jurisdiction over the greater sage-grouse in Nevada - commented on the administrative draft of the proposed plan that the SFAs did

not "represent the most important landscapes" and expressed concerns that the re-prioritization of management actions to the SFA with a lack of state input misplaced conservation priorities "as a result of policy-based, rather than science-based, planning." Coeur shares these concerns with the habitat mapping designations included in the ARMPA. The mapping of lands as priority and general habitat was based on high level modeling and does not reflect accurate on-the-ground conditions.

In the RMP FEIS, lands formerly classified as SFA must be managed according to their actual habitat conditions based on site-specific habitat data. The SFA lands must not be automatically reclassified as PHMA because the SFA in the 2015 LUPs include areas of non-habitat and areas that should be classified as General Habitat Management Areas ("GHMA") and Other Habitat Management Areas ("OHMA"). In all cases, habitat designation must be site-specific and based on science, not policy. Coeur recommends removing landscape-scale habitat designations developed with remote sensing data and modeling such as PHMA, GHMA, and OHMA from the 2018 RMP FEIS and replacing them with the historic range of greater sage-grouse habitat as a single designation within which field-verified data is incorporated into NEPA analysis.

ES-5 ES-9 Table ES-4, Management Alignment Alternative This column states that Fgement Area (Table 2-1 in Chapter 2) would be adjusted to match the newest Habitat Management Area boundaries (Coates et al. 2016). However, Coates et al. 2016 didn't adopt the Sage-grouse Management Area (SGMA) boundaries, the State of Nevada did when it approved its Habitat Management Category Mapping in December 2015. Is the BLM suggesting that the SGMA boundaries will change, or the habitat classifications (priority, general and other) within the SGMAs, or both? We would advocate for maintaining the SGMA boundaries since those have been previously set and approved by the State, and then updating the categories within the boundaries as appropriate. This clarification must be made to provide consistent mapping that has alignment between the State, BLM and USGS (Coates et al) mapping products. ES-4 ES-9 Table ES-4 Paragraph 1: BLM will need to verify this, but Coates et al. 2016 identifies BSU boundaries, and the State of Nevada through its Sagebrush Ecosystem Council established Habitat Management Areas / SMGAs (see above comment).

Table 2-2 Issue: Modifying Habitat Management Area Designations We note the following for the record, and to confirm that these categories are broad scale, and that ground truthing is of paramount importance. The mapping and designation of lands as priority habitat is infested with local errors that show the maps cannot be relied upon for local scale decision making. As one of many examples we are aware of, there is a large area in southern Eureka County designated as a PHMA that incorrectly includes the Town of Eureka, US Highway 50, State Route 278, the Eureka County landfill, the Falcon-to-Gondor major distribution power line, multiple ancillary power lines, multiple subdivisions with homes, paved roads and gravel roads, farms with alfalfa fields and irrigation systems, and hay barns, among other infrastructure, and pinyon-juniper woodlands. These arbitrary and incorrect habitat delineations could have serious implications for Eureka County and our socioeconomic viability if not verified by local information and ground-truthing. See County Needs Attachment 2 2-6 2-7 Table 2-2 Issue: Modifying Habitat Management Area Designations Conform to management areas identified by the states Revise Topic from "Conform to management areas identified by the states" to "Update management areas to incorporate current best available science which are the management categories identified by the states." BLM is required to use the best available science. The current habitat maps in Alternative A are not the best available science as documented by USGS. Therefore, BLM cannot select Alternative A habitat maps. The State habitat map from December 2015 is the best available science and

must be selected by BLM. It was the map developed in Coates et al. 2016 with further refinements based on local scientific expertise of NDOW and the SETT. No-Action Alternative: The BLMs continued reliance on the same maps that it published in the previous LUPA process is highly flawed. These maps are based on analysis described in Coates et al 2014, which has since been updated (Coates et al 2016). Therefore, the use of the previously published maps does not meet the standard of utilizing the "best available science". In the document abstract, Coates et al 2016 specifically lists the updates that were made between 2014 and 2016, by stating: These updates include: (1) adding radio and GPS telemetry locations from sage-grouse monitored at multiple sites during 2014 to the original location dataset beginning in 1998; (2) integrating output from high resolution maps (1-2 m2) of Page 20 of 89 sagebrush and pinyon-juniper cover as covariates in resource selection models; (3) modifying the spatial extent of the analyses to match newly available vegetation layers; (4) explicit modeling of relative habitat suitability during three seasons (spring, summer, winter) that corresponded to critical life history periods for sage-grouse (breeding, brood-rearing, over-wintering); (5) accounting for differences in habitat availability between more mesic sagebrush steppe communities in the northern part of the study area and drier Great Basin sagebrush in more southerly regions by categorizing continuous region-wide surfaces of habitat suitability index (HSI) with independent locations falling within two hydrological zones; (6) integrating the three seasonal maps into a composite map of annual relative habitat suitability; (7) deriving updated land management categories based on previously determined cut-points for intersections of habitat suitability and an updated index of sage grouse abundance and space-use (AUI); and (8) masking urban footprints and major roadways out of the final map products. Given the above updates, the BLM should NOT rely on the Coates et al 2014 mapping data for any Alternative as it is clearly out of date. One concern with reliance on this out of date and incomplete mapping product is specifically with update #8 listed in Coates et al 2016. The BLMs current maps include: the Town of Eureka, US Highway 50, State Route 278, the Eureka County landfill, the Falcon-to-Gondor major distribution power line, multiple ancillary power lines, multiple subdivisions with homes, paved roads and gravel roads, farms with alfalfa fields and irrigation systems, and hay barns, among other infrastructure, and pinyon-juniper woodlands. These arbitrary and incorrect habitat delineations could have serious implications for Eureka County and our socioeconomic viability if not verified by local information and ground-truthing. The allocation decisions associated with these flawed maps has resulted in direct harms and potential future harms to local government in its required administrative function and resulted in inconsistent implementation of the LUPA. Management Alignment Alternative: The BLM needs to better explain its alignment with State approved maps for the overall perimeter of Sage-grouse Management Category Areas (SGMCA) as well as management area categories within that perimeter: PHMA, GHMA, and OHMA. Please keep in mind that SGMCA is defined on Page 10 of the State Plan as "The spatial extent of sage grouse management in Nevada…" and SGMCAs were approved by the State through its Sagebrush Ecosystem Council with technical input from NDOW and the SETT. The management area categories within the SGMCA perimeter were developed by USGS (Coates et al 2016). Page 21 of 89 The BLM should adopt the SGMCA mapping approved by the Nevada Sagebrush Ecosystem Council in December 2015. This mapping was developed utilizing the analysis completed and described by Coates et al 2016, including additional refinement by the scientific experts associated with the Nevada Department of Wildlife and the Nevada Sagebrush Ecosystem Technical Team. The BLM should consult with both to better describe and document the refinements that were made between the Coates et al 2016 product and the maps adopted and dated December 2015. We agree with and support the statement made in Paragraph 2 and 3. The approach of groundtruthing is supported by both Coates et al 2014 and Coates et al 2016 in the following statements made in the Conclusion section: The power of this approach rests within the map output that can be downscaled back to the local level that may help

inform specific, "on the ground", habitat-management decisions. However, it is important to recognize that field data and other sources of information should be used in conjunction with inferences from this model. (Coates et al 2014) [emphasis added] In the third paragraph, consider revising "based on Stiver et al." to "such as Stiver et al." BLM must not limit themselves to just Stiver et al. 2015 when there may be other scientifically appropriate methods to use for ground truthing through RMPA implementation. See County Needs Attachment 2 2-7 Table 2-2, Issue 1, Modifying Habitat Management Area Designations Sub-issue 2, Habitat management Revise Topic from "Habitat management area designations flexibility" to "Future habitat management area designations refinement with new best available science" Again, BLM must select Alternative B based on the requirement to use best available science. For Alternative B, it is important that local government agencies are given a seat at the table in future updates. As noted above, BLM is required to coordinate and consult with local governments as well. And, it's just good business to do so. The local agencies often have local information that is imperative to the process. Also make it clear that any habitat category changes must be through a vote of the SEC. This requires a public process through NV Open Meeting Law. Right now, this section does not make it clear that the State Plan mandates Page 22 of 89 area designations flexibility changes be made through the SEC. To address these comments, please revise the language in the second paragraph to read "The review and refinement process would be scientifically based and occur through the Nevada Sagebrush Ecosystem Program process which would include review and input from the SETT, NDOW, BLM, USFS, and USFWS and local government agencies, especially related to local knowledge, and approval from the SEC." No-Action Alternative: Once again, we would stress that this alternative's reliance on Coates et al. 2014 relies on outdated information, and not "best available science" as described in the above comments. Management Alignment Alternative: We generally support this approach, and would emphasize the need to include two key factors in any mapping update: 1. Input from local government, including but not limited to: Counties, Conservation Districts and Local Area Work Groups (established specifically for local Sage-grouse Conservation Efforts); and, 2. Mapping updates should incorporate any new information derived from project-specific ground-truthing and/or exemption decisions made since the last update. While we support the streamlined process for incorporating such updates through "plan maintenance", there may be occasion where such changes are warranted through a more formal plan amendment process. As such, we suggest incorporating language from No-Action Alternative, that reads "Through plan maintenance or plan amendment/revision, as appropriate…". There should be a clear description of the conditions under which plan maintenance is appropriate for map revisions versus plan amendment/revision. For instance, Coates et al 2016 states, because only 6.5 and 8.5 percent area classified as habitat and management category changed between studies, the updated maps represent model refinements based on better input data rather than a complete mapping overhaul. (page 18) [Emphasis added] To address these comments, please revise the language in the second paragraph to read "The review and refinement process would be scientifically based and occur through the Nevada Sagebrush Ecosystem Program process which would include review and input from the SETT, NDOW, BLM, USFS, and USFWS and local government agencies, especially related to local knowledge, and approval from the SEC." Page 23 of 89 Add "when appropriate" to read "…through plan maintenance, when appropriate." It should also be clear that BLM is not pre-decisional in that every change in the management designations would be through plan maintenance; BLM must leave room for changes be made through a plan amendment when necessary (and plan maintenance is not appropriate).

"Wild fire and the period of time for recovery from fires has become a regulatory issue in Eureka County that has caused unreasonable economic hardship to Eureka County livestock producers.

Properly managed grazing provides a substantial advantage for native plant recovery following fire. Prohibition of grazing following wildfire is not necessary for the recovery of rangeland vegetation. Managed grazing is beneficial in preventing excessive damage to plants by wildfire and prohibition of grazing prior to a fire results in unnecessary damage to the plants" (p. 6-8). The DEIS includes provision to defer grazing after wildfires in all cases and does not fully recognized properly managed grazing as the best and primary tool to manage fuel loads before and immediately after fires. This must be included. Specifically, there needs to be inclusion of a methodology to allow for and streamline Temporary Non-Renewable (TNR) allocation of forage for fuels reduction in general and specifically including measures to allow for targeted cheatgrass control through TNR.

"Identify measurable accomplishments or benefits that will be obtained through future designation of restricted use areas; no designation of restricted use areas such as Roadless, ACEC, or others will be completed until it is clearly demonstrated that such designations will not be detrimental to existing property rights, recreation including hunting or fishing, livestock grazing management, wildlife habitat management, County administrative needs, and future mining or energy development" (p. 6-37). These criteria were not followed or met in designation of ACECs and restricted areas/uses in PPMA and PGMA.

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C.4.4 Sagebrush Focal Area (SFA) Designations

Removing Sagebrush Focal Area Designations PGC strongly supports BLM's October 1 1, 2017 decision to cancel this unwarranted withdrawal application, which if implemented, would have had no measurable benefits to GSG and its habitat while at the same time would have caused significant socio-economic hardships in the six SFA states (e.g., Idaho, Montana, Nevada, Oregon, Utah, and Wyoming). Because the 2016 Withdrawal DEIS contained important information on geology, mineral resources, and the beneficial socioeconomic impacts of mining, we are pleased that the 2018 DEIS is tiered to and incorporates this document by reference.

We also recommend that the 2018 FEIS incorporate by reference the October 2016 Mineral Potential Report and Sagebrush Mineral Resource Assessment that the U.S. Geological Survey ("USGS") prepared for BLM. Incorporating the October 2016 USGS Mineral Potential Report would cure the deficiencies in the 2015 FEIS, which did not include Affected Environment or Environmental Consequences for Geology and Minerals. It is not currently included in the references section in the 2018 DEIS or specifically incorporated by reference and needs to be added. The 2016 SFA Withdrawal DEIS presents overwhelming documentation of the miniscule impact that mineral activities within the SFAs would create over the next 20 years and the enormous economic harm that the proposed withdrawal would cause in Nevada that justifies BLM' s selection of the Preferred Alternative in the 2018 DEIS to jettison the SFA withdrawals. As documented in the 2016 SFA Withdrawal DEIS, the footprint of mining and mineral exploration activities in the SFAs as designated in the 2015 LUPs was projected to amount to a

mere 2,620 acres across the six SFA states. BLM quantifies these impacts as affecting only about 0.026 percent of the 10 million-acre SFAs. (2016 SFA Withdrawal DEIS at 4-75). The 2016 SFA Withdrawal DEIS also includes important information about the scope of mining impacts under a No Action Alternative (i.e., without the SFA withdrawals), which is now BLM's Preferred Action in the 2018 DEIS: . . .the total amount of mining related disturbance in sagebrush habitat under the No Action Alternative would be 9,554 acres, or approximately one-tenth of 1 percent of the total withdrawal area... These disturbances could impact vegetation communities on 0.1 percent of the SFAs with the majority of the impacts estimated to occur in Nevada and Idaho." (SFA Withdrawal DEIS at 4-71 and 4-72, bold emphasis added.)

The 2016 SFA Withdrawal DEIS clearly documents that mineral activities do not adversely impact GSG or its habitat and that the proposed withdrawal was unwarranted. In light of this information, BLM is completely correct and justified in excluding the SFA mineral withdrawal from its Preferred Alternative in the 2018 DEIS and must reject the No Action Alternative considered in the 2018 DEIS which would preserve the SFA withdrawals. PGC wants to emphasize that the lands formerly classified as SFA must be managed according to their actual habitat conditions based on site-specific habitat data. The SFA lands must not be automatically reclassified as Priority Habitat Management Areas ("PHMA") because the record in Western Exploration, LLC v. U.S. Dep 't of the Interior, 250 F. Supp. 3d 718, ("Nevada litigation") documents that the SFA in the 2015 LUPs include areas of non-habitat and areas that should be classified as General Habitat Management Areas ("GHMA") and Other Habitat Management Areas ("OHMA"). For example, during preparation of the FEIS, BLM ignored the advice from Nevada's wildlife experts at the Nevada Department of Wildlife ("NDOW") regarding the location of the most important GSG habitat areas: "Top Nevada BLM officials knew that roughly 26 percent (723,000 acres) of the 2.8 million-acre Nevada SFA was not priority habitat - it included lower priority habitat and 75,100 acres of non-habitat. They also knew from NDOW's comments.. .that the State's wildlife experts said the SFAs "do not fully represent the most important landscapes." NDOW expressed concerns about the reprioritization of management actions to the SFA given the lack of state input and that the "conservation priorities may be misplaced as a result of policy-based, rather than science-based, planning." Nevada litigation, Motion for Summary Judgment, Case 3: 15-cv-00491 -MMD-VPC, Document 67 at 6 - 7, 04/01/16.

The Nevada litigation record also reveals that the SFA designation did not reflect actual habitat conditions because BLM officials inappropriately "turned" lower priority habitat and non-habitat into SFAs: "The FEIS designated 2.8 million acres as SFA, which caused an additional 722,800 acres to be designated as PHMA, turned 436,000 acres of GHMA into PHMA, turned 211,100 acres of OHMA into PHMA, and turned 75,100 acres of non-habitat into PHMA." Nevada litigation, Order, Case 3:15-cv-00491-MMDVPC Document 126 at 37, 03/31/17. There are inconsistencies in the discussion of future management of the former SFA in the 2018 DEIS. The description in Table 2-2 on Page 2-8 states "Lands previously identified as SFA would be managed according to their underlying habitat management area designation (PHMA, GHMA, or OHMA.. .)". However, Pages 4-12, through 4-19 include text that implies that SFA would be automatically designated as PHMA: "[SFA] would still be managed according to their underlying Greater Sage Grouse habitat management area and associated allocations and management decisions (e.g., PHMA)." DEIS at 4-12. The DEIS needs to clarify that the SFA would be managed according to actual habitat characteristics based on site-specific, on-the-ground habitat data. The blanket, one-size-fits-all restrictions on mineral exploration and development, grazing, renewable and conventional energy development, transmission lines and pipelines, and access and travel in the SFA are

inappropriate. Future land use restrictions on lands formerly designated as SFA must be applied surgically on a case-by-case basis based on actual, field-verified habitat conditions. Additionally, such restrictions, if warranted, cannot substantially interfere with claimants' rights under the Mining Law and FLPMA to explore for and develop minerals or to access and occupy public lands for mineral purposes.

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Given the proposed removal of SFAs, the DEIS does not appear to address any new 'reasonably foreseeable development' based on this proposed change.

The County remains concerned that inclusion of SFAs in other counties will result in a lack of priority (money and effort) spent improving and conserving habitat in Churchill County.

The NvMA appreciates and strongly supports the removal of references to Sagebrush Focal Areas. The NvMA has long questioned the legality of past federal actions and the scientific basis for SFAs. We believe they are an artificial construct developed to improperly restrict mineral development. We also strongly support the formalization of the removal of all references to mineral withdrawals associated with SFAs.

Conserve all of the most important sage-grouse habitat, including Sagebrush Focal Areas within Priority Habitat Management Areas. As an example, winter habitat is particularly important to sage-grouse, mule deer and other wildlife, but the current federal plans fail to protect those areas from harmful land use and development. In the Sagebrush Focal Areas as listed in the original 2015 plan, federal land use plans will avoid new surface disturbance and recommend that the areas be withdrawn from new hardrock mining claims.

Removing Sagebrush Focal Area (SFA) Designations No-Action Alternative: The County is adamantly opposed to the No-Action Alternative and inclusion of the Sagebrush Focal Area Designations in any future management. Management Alignment Alternative: The County supports complete removal of the Sagebrush Focal Area Designation as proposed under this Alternative.

additional time should be allotted for public and SEC consideration, especially as to the adequacy and accuracy of the maps before abandoning this principle which focuses on the key elements of both connectivity and landscape scale view.

But on October 11, 2017, the DOI reversed course, cancelling the proposed withdrawal and terminating preparation of the Final EIS. 82 FR 47248. Despite the significant number of leks within the proposed withdrawal area, "BLM has determined that the lands are no longer needed in connection with the proposed withdrawal." Id. The 2018 Draft EIS states: "The BLM determined the proposal to withdraw 10 million acres was unreasonable in light of the data that showed that mining affected less than 0.1 percent of Greater Sage-Grouse-occupied range." Id. at 1-1. However, the 2018 Draft EIS ignored the first part of that statistic from the 2016 SFA Withdrawal DEIS: "The total number of leks that could be directly impacted by [a withdrawal in SFA] represent approximately 2.7 percent of all the leks, [and] the number of sage-grouse that could be impacted represent approximately 1.3 percent of all male sage-grouse populations across the withdrawal area…" Id. at 4-95. For a species in decline, preserving nearly 3 percent of the leks (where mating occurs) is significant. To preserve regulatory certainty that the Greater sage-grouse will remain viable, the science demands that BLM should again propose as part of the 2018 plan amendment that the Secretary withdraw lands in areas designated as SFAs in the 2015 RMP; at the very least, BLM must retain the SFAs or comparable protections, due to the additional protections afforded to them under the 2015 ARMPA. The 2018 Draft EIS mistakenly conflates - and equates - SFAs solely with withdrawals. Now that BLM has abandoned the withdrawal, the 2018 Draft EIS claims that "SFAs presented no additional conservation and management restrictions above PHMA with the exception of the mineral withdrawal recommendation discussed above." Id. at 4-12. This is demonstrably false, however, as the 2015 ARMPA provide numbers additional protections to greater sage-grouse above and beyond the mineral withdrawal, including: * Exceptions to stipulations for fluid mineral leasing are authorized for PHMA, but prohibited in SFA; NV/CA ARMPA at 1-10, 2-29; * Review and processing of grazing permits is prioritized in SFA over PHMA; id. at 1-11, 2-24; * Field checks for grazing, focusing on the health of riparian areas and wet meadows, are prioritized in SFA over PHMA; id. at 1-11, 2-26; * Fire and fuels management is prioritized in SFA over PHMA; id. at 2-18; * Pre-

suppression of fire is prioritized in SFA over PHMA; id. at 2-19; * Land health assessments are prioritized in SFA over PHMA; id. at 2-24; and * Complete rangeland health assessments are prioritized for SFA over PHMA. Id. at 2-27. The 2018 Draft EIS contains no substantive analysis of how striking those habitat protections through eliminating SFAs would negatively impact the Greater sage-grouse and its habitat, thus violating NEPA. SFAs are "areas that represent recognized strongholds for GRSG that have been noted and referenced as having the highest densities of GRSG and other criteria important for the persistence of the species." NV/CA ARMPA at 1-6. These protections discussed above must be maintained in PHMA if SFAs will not be retained. The value of these protections was recognized by the Fish and Wildlife Service in its 2015 not warranted decision, and thus are a key component of the land use plans that must be maintained if the not warranted decision is to be sustained, which it must be. "Based on our recommendation to further protect sage-grouse population centers that have been identified in the scientific literature as critically important for the species and areas identified through our analysis as important for conservation, BLM and USFS designated areas as Sagebrush Focal Areas (SFA) and added protections that would further limit new, human-caused surface disturbance in SFAs." 80 Fed. Reg. 59858, 59875 (Oct. 2, 2015). SFAs "are the areas that the Federal Plans manage as the highest priority lands in PHMAs for sage-grouse conservation (Figure 5)." Id. at 59878. They are "strongholds" for sage-grouse conservation and as mentioned above contain important connectivity habitat and high densities of breeding birds. Id. FWS recognized that in addition to PHMA protections, the protections mentioned above would also apply in SFAs, including mineral entry withdrawal, NSO stipulations for fluid minerals with no waivers, exceptions, or modifications, and prioritizing management and conservation actions. Id. This was because SFAs need "the most conservative strategies to protect sage-grouse and habitat." Id. Grazing permit review is also prioritized in SFAs. Id. at 59877, 59910. Clearly the protections in SFAs that would be lost by eliminating SFAs must be maintained in the remaining PHMAs, including in the Nevada and Northeast California plan. The final plan amendments should specifically provide that the fluid minerals NSO stipulation with no waivers, exceptions, or modifications, the vegetation and conservation management stipulation, and where appropriate the prohibition on geothermal development will be specifically incorporated into and made a part of the PHMAs as appropriate to protect this most important habitat.

Invasive plants are well known to colonize areas of disturbance, including those caused by mining operations. Maintaining the SFA designation and withdrawing those lands from the mining law of 1872 will both prevent habitat fragmentation and reduce the spread of invasive plants. Reducing or eliminating these key threats by upholding the SFA designation is imperative to the future of this species.

The Nevada DEIS at ES-3 seeks additional information to ensure that the SFA mineral withdrawal has been cancelled and its cancellation justified, in addition to further information concerning whether the SFA area designations remain relevant in the absence of a mineral withdrawal. Further, the DEIS seeks information on whether the SFA habitat designation is even necessary to adequately maintain conservation of GRSG habitat. Id. As a part of the range-wide approach to the BLM and USFS land use plans in the previous Administration, approximately 10 million acres of available public lands were withdrawn and made inaccessible under the 1872 Mining Law, including 2,767,552 acres in Nevada. The preview to the formality of the actual withdrawals became evident in the ROD and the ARMPAs. See Notice of Proposed Withdrawal; Sagebrush Focal Areas; Idaho, Montana, Nevada, Oregon, Utah, and Wyoming and Notice of Intent to Prepare an Environmental Impact Statement, 80 Fed. Reg. 57635-01 (Sept. 24, 2015) (notifying the public of the proposed withdrawal of BLM and USFS lands identified as SFAs in Idaho, Montana, Nevada, Oregon, Utah and Wyoming). The notice also began a two-year

segregation period which prohibited location and entry from those lands identified as SFAs. However, when the NEPA process began to facilitate the withdrawals, the purported threat to the GRSG as dictated by the FWS was infinitesimal compared to the overall acreage proposed to be withdrawn. The BLM DEIS noted: "The total amount of mining related disturbance in Sagebrush habitat under the No Action Alternative [no withdrawal] would be 9,554 acres . . ., or approximately one-tenth of 1 percent of the total withdrawn area." (Emphasis added). Sagebrush Focal Areas Withdrawal Environmental Draft Impact Statement Idaho, Montana, Nevada, Oregon, Utah, and Wyoming (Dec. 2016) at 4-71. Indeed, the difference in acres that could be disturbed over 20 years between no withdrawal and a withdrawal of approximately 10 million acres was a mere 6,934 acres. Based on the erroneously calibrated threat to GRSG from mining and other resource development, on October 11, 2017, BLM allowed the two-year segregation period to expire by operation of law and cancelled the proposed SFA withdrawal. See Notice of Cancellation of Withdrawal Application and Withdrawal Proposal and Notice of Termination of Environmental Impact Statement for the Sagebrush Focal Area Withdrawal in Idaho, Montana, Nevada, Oregon, Utah and Wyoming, 82 Fed. Reg. 47248-01 (Oct. 11, 2017). The obsolescence and imprecision by which the SFA allocations remain in the current ARMPAs, including Nevada, remains apparent. Other restrictions tied to the designation of the SFAs, if legitimate to advance GRSG conservation, can be developed with a scalpel, as opposed to the overbroad and miscalculated Page Fourteen scope of proposed withdrawals advocated by the previous Administration. Accordingly, the LUP should be amended to eliminate the SFA allocations.

The previous land use plans were not crafted under a premise that balanced the Congressional directives under the 1872 Mining Law and FLPMA. The Nevada 2015 ARMPA was driven by an effort by the previous Administration to achieve an outcome under the ESA, and, out of necessity, the balance required between 1872 Mining Law and FLPMA was minimized. As observed by a senior Administration official at the time, the 2015 GRSG LUPAs were "not a planning exercise, but an effort to develop a landscape level plan to conserve the GRSG." In other words, the BLM and USFS endorsed a policy decision by the previous Administration that an ESA outcome, a Washington, D.C. directed outcome under the ESA, was to prevail over local values and considerations that the 1872 Mining Law and FLPMA accommodate. The litigation Page Seventeen administrative record reveals that FWS Director Dan Ashe assumed command of determining when the cosmetic "good-faith" negotiations with the States advancing their land use management plans needed to be directed differently, or in some cases, terminated in favor of national ESA uniformity.10 Stated differently, the interested constituencies found themselves negotiating with the FWS over Federal activity wholly within the province of the BLM. On October 11, 2017, the BLM published a Notice of Cancellation of Withdrawal Application and Withdrawal Proposal and Notice of Termination of [EIS] for [SFAs] Withdrawal in Idaho, Montana, Nevada, Oregon, Utah and Wyoming ("Cancellation Notice"), 82 Fed. Reg. 47248-01 (Oct. 11, 2017). The BLM determined that "the lands are no longer needed in connection with the withdrawal. The BLM has also terminated the preparation of an [EIS] evaluating this application. Id. at 47248. It also provided notice that the two-year segregation expired by operation of law on September 24, 2017. Id. Accordingly, for the reasons stated above, the unlawful SFA withdrawals should not be revived.

Specifically, the GRSG LUPA in (at least) Nevada includes the following Management Directions that demonstrate these flaws / consequences: Nevada MD LG 2: The BLM will prioritize (1) the review of grazing permits/leases, in particular to determine if modification is necessary prior to renewal, and (2) the processing of grazing permits/leases in SFA followed by PHMAs outside of the SFA. In setting workload priorities, precedence will be given to existing permits/leases in these areas not meeting land

health standards, with focus on those containing riparian areas, including wet meadows. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (e.g., fire) and legal obligations. Nevada MD LG 4: Complete land health assessments in PHMAs and GHMAs to identify whether or not GRSG habitat objectives (Table 2-2) are being met. The priority order for completing land health assessments in GRSG habitat is: 1. Allotments containing SFA that have never been evaluated 2. Allotments containing SFA that have not been re-evaluated in 10 or more years. 3. Allotments containing PHMA that have never been evaluated. 4. Allotments containing PHMA that have not been re-evaluated in 10 or more years. 5. Allotments containing GHMA that have never been evaluated 6. Allotments containing GHMA that have not been re-evaluated in 10 or more years. Issue #5, Recommendation 6: Any decision from this process should amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180 (see Issue #2). Issue 5: DEIS Comment 6: The DEIS at page 2-8 appears to appropriately remove MD LG 2 and MD LG 4 as to at least SFA areas (aka "No similar action"). It is critical that BLM consider carry this recommendation forward in the FEIS, and implement a proposed action in the ROD that adopts the removal of MD LG 2 and MD LG 4. See also DEIS Comments 7, 8, below. Issue #5, Recommendation 7: Agency staffing will not allow for prioritizing all allotments within SFAs; the inability to do so will result in litigation, causing unnecessary commitment of federal resources to litigated areas. BLM grazing regulations via 43 C.F.R. 4180.2(c) already requires BLM to make management changes in order for allotments determined to not be meeting rangeland health standards to move towards meeting. As such, additional language covering this is not legally required or rational (see Issue #2). Putting focus on grazing within focal areas is irrational unless a trigger has been tripped and a correlation has been made to existing livestock grazing (as opposed to historical livestock or other grazing practices). Issue #5, Recommendation 8: BLM must remove any and all reference to SFAs. SFAs are an overreach and unnecessary as priority habitat designations provide adequate habitat protection. The LUPAs must be amended to address this overreach of elevating livestock grazing to a primary threat, and not prioritize permit renewals in priority habitat unless a hard trigger is tripped and a cause and effect relationship is established, as published in alternative E of the DLUP of the Idaho plan. Issue 5: DEIS Comments 7, 8: See DEIS Comment 6 above. The DEIS at page 2-8 appears to remove MD LG 2 and MD LG 4, among other Decision numbers, but the DEIS is hard to decipher whether the management alignment alternative just removes SFAs from those items, or deletes them in their entirety. BLM should remove MD LG 2 and MD LG 4 in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

The removal of Sagebrush Focal Areas (SFAs) Designation is a concerning issue we want to address. Under the No-Action Alternative, 2,767,552 acres would be designated at SFAs and the Greater Sage-grouse and its habitat would be shielded from harmful mining activity. Conversely, under the Bureau's Preferred Management Alignment Alternative, there is no such designation, and lands would be identified as PHMAs, GHMAs, or OHMAs instead. The Bureau wants to make it clear that SFA mineral withdrawal has been cancelled and that there is a justified reason for the cancellation. However, such a habitat designation is needed to adequately maintain conservation of the Greater Sage-Grouse. The Bureau's preferred habitat management area designation does not necessarily provide the strongest form of protection. Therefore, we believe a stronger form of protection can be created in according to the conservation alternative.

Elimination of SFA's in these plans will be detrimental to holistic, landscape scale management of the species.

The severe socioeconomic impact analyses and minimal habitat benefit analyses revealed in the DEIS for the proposed mineral withdrawal reinforce that the SFA designation was improper, and while the SFA proposed withdrawal has since been cancelled, the improper SFA designation remains in place under the No Action alternative and should be removed as suggested and analyzed in the Management Alignment Alternative. Such removal of the SFA designation still leaves appropriately mapped (if correctly identified) areas protected as PHMA which, as the BLM discloses and analyzes, is a more advantageous and effective way to manage the habitat from both a multiple-use standpoint to allow for responsible development with appropriate mitigation and also from a conservation perspective. Outright prohibitions such as those included under the No Action alternative do not achieve optimum multiple-use or conservation are inappropriate, unlawful and should be rejected.

the Management Alignment Approach should be adopted over the No Action alternative given that the criteria the agencies described for producing the SFA does not match the State's assessment of breeding bird densities or resistance and resilience mapping statewide, and it is unclear what criteria were applied to determine which landscapes qualify as being 'essential to conservation and persistence of the species.' The agencies blindly adopted the stronghold area/SFA from the October 2014 FWS memo with no adequate disclosure of what science or data supported the SFA boundaries. WEX strongly supports the BLM's attempt to address this issue through use of an updated map and clarification, explanation and commitment to considering ground-truthing, site-specific data and the best available science as analyzed under the Management Alignment Alternative.

Removing Sagebrush Focal Area (SFA) Designations: The County does NOT support the "No Action Alternative" for the following reasons. The County encompasses 9,626 square miles (6.2 million acres) in north central Nevada and many of those acres fall within the SFA designation as adopted in the 2015 1-UP. An analysis was performed for the Sagebrush Focal Area Withdrawal, which helps to illuminate some of the significant direct and indirect fiscal impacts to Nevada's communities. For example, the BLM noted that the social and economic implications of the restrictions, including a mineral withdrawal, may occur with disproportionally high and adverse effects among minority populations, low income populations, or Indian tribes. The County in particular stands be harmed by the SFA, given that it closes roughly 633,000 acres in Humboldt Count to renewable energy, and oil and gas, and threatens to reduce ranching operations. The SFA restrictions greatly impedes county wildfire management efforts. Managed cattle grazing is a proven tool to manage fuel load during periods of high fire risk-yet another inconsistency that the BLM must consider. Wildfire grazing prescriptions have proven effective on a large-scale at low cost. If the SFA exclusion zone prevents or severely restricts grazing, a large effective management tool will disappear. The 2015 LUP unnecessarily interferes with grazing practices and disallows good grazing and agricultural management underway in the County. The SFA is grossly inconsistent with the multiple use principles in Humboldt County's Master Plan and related management plans and will cause significant hardships in the County. The County supports the "Management Alignment Alternative" to remove the SFA designation.

The County has a record of arguing against this designation and subsequent mineral withdrawal and would cite its previous correspondence to this affect (see paragraph 2 above). The Management Alignment Alternative would be much more consistent with the County's Master Plan by removing SFA designations.

1 1-8 Table 1-2, Row 2, Removing SFAs Please add a reference to the District Court of Nevada's Order.

4-10 13-15 This section does not assist with the Issue previously described where BLM listed needing to "ensure it is clear the SFA mineral withdrawal has been cancelled." It is appropriate to make that clarification here. Consider inserting in this section "Given the subsequent information obtained through the associated Mineral Potential Report and Socioeconomic Impacts Analysis, the Oct. 4, 2017 Notice of Cancellation of Withdrawal Application and Withdrawal Proposal explained that "the BLM determined the proposal to withdraw 10 million acres was unreasonable in light of the data that showed that mining affected less than .1 percent of sage-grouse-occupied range."

The 2015 ARMPA is inconsistent with the Elko County Land Management Plan and violates FLPMA because it includes over 2.8 million acres in Nevada of Sagebrush Focal Areas ("SFAs") where certain land uses are categorically prohibited and where multiple use is eliminated or severely restricted. Lands within the SFA will be withdrawn from operation of the Mining Law so that these lands cannot be used for mineral exploration and development purposes. The SFA also prohibits wind and solar energy projects, imposes No Surface Occupancy restrictions on oil and gas and geothermal exploration and development, limits major and minor Rights-of-Way, and places unreasonable requirements that limit the use of these lands for livestock grazing. The SFA prohibitions and restrictions are incompatible with the foundational principles of the Elko County Conservation Plans, Section 6.5.1 the Elko County Plan, and FLPMA's multiple use and consistency mandates. Elko County bears the brunt of the SFA land use prohibitions and restrictions in Nevada because the SFA covers over 2 million acres in northern Elko County, which is roughly 72 percent of the 2.8 million acres of SFA in Nevada. Numerous private land parcels are located adjacent to or within the Elko County SFA. Theses parcels are private lands currently used for ranching purposes that are comprised of lands cultivated for alfalfa hay or small grains, stream-irrigated meadows used to grow native wild hay, and pastures with sufficient carrying capacity to support cattle. The future viable use of these private land parcels depends in large part on the landowners' ability to use the adjacent public lands for livestock grazing. Because streams and wet meadows are high-quality, seasonal habitat for greater sage-grouse, interfering with the continued use of private land parcels with streams and meadows will cause loss of some of the best brood-rearing and summer habitat. (See COT Report, Table 4-1 and Final EIS, Table 2.2 and Pages 2-39 and 2-57 and the 2014 Nevada Greater Sage-Grouse Conservation Plan Section 7.5 ("Nevada Conservation Plan")), which all emphasize the importance of riparian and wet meadow habitats. Unfortunately, the management directives for the SFA threaten to eliminate or reduce the authorized use of the adjacent public lands for livestock grazing by imposing unworkable and prescriptive one-size-fits-all habitat management objectives. Elko County estimates from GIS mapping that roughly 236,000 acres of Elko County private lands are adjacent to or engulfed by the SFA. The current use of these private land parcels for agriculture and ranching will be adversely affected by restrictions on grazing on adjacent public lands. Thus the SFA will diminish or even eliminate future economic agriculture and ranching uses on private property causing substantial economic harm to individual landowners and Elko County in general and potentially subject the federal government to regulatory takings claims. The SFA will create stranded inholdings of private land parcels surrounded by public land managed for the sole purpose of greater sage-grouse conservation. Cultivated fields, meadows, and pastures provide critically important brood-rearing habitat for the greater sage-grouse. So, in addition to harming landowners within and adjacent to the SFA, the potential diminished agricultural and ranching uses of the private land parcels due to restrictions on adjacent public lands could have a significantly adverse impact on up to 236,000 acres of greater sage-grouse habitat. Any reduction in the size or distribution of these crucial but limited seasonal greater sage-grouse habitats will harm the species.

The 2016 SFA Withdrawal DEIS clearly documents that mineral activities do not adversely impact GSG or its habitat and that the proposed withdrawal was unwarranted. In light of this information, BLM is completely correct and justified in excluding the SFA mineral withdrawal from its Preferred Alternative in the 2018 DEIS and must reject the No Action Alternative considered in the 2018 DEIS which would preserve the SFA withdrawals. WMC wants to emphasize that the lands formerly classified as SFA must be managed according to their actual habitat conditions based on site-specific habitat data. The SFA lands must not be automatically reclassified as Priority Habitat Management Areas ("PHMA") because the record in Western Exploration, LLC v. U.S. Dep't of the Interior, 250 F. Supp. 3d 718, ("Nevada litigation") documents that the SFA in the 2015 LUPs include areas of non-habitat and areas that should be classified as General Habitat Management Areas ("GHMA") and Other Habitat Management Areas ("OHMA"). For example, during preparation of the FEIS, BLM ignored the advice from 3 The 2016 SFA Withdrawal DEIS documents that the proposed 20-year withdrawal would cause a staggering aggregate adverse impact of $14 billion in reduced economic output, $2.4 billion in less labor compensation, and 34,000 fewer jobs in five of the six SFA states, with Nevada, Idaho, and Wyoming bearing the brunt of these impacts. 4 The 2,620 acres is comprised of 187 acres in Idaho, 81 acres in Montana, 2,285 acres in Nevada, 66 acres in Oregon, 1 acre in Wyoming, and 0 acres in Utah. (SFA Withdrawal DEIS at 2-10). Nevada's wildlife experts at the Nevada Department of Wildlife ("NDOW") regarding the location of the most important GSG habitat areas: "Top Nevada BLM officials knew that roughly 26 percent (723,000 acres) of the 2.8 million-acre Nevada SFA was not priority habitat - it included lower priority habitat and 75,100 acres of non-habitat. They also knew from NDOW's comments…that the State's wildlife experts said the SFAs "do not fully represent the most important landscapes." NDOW expressed concerns about the reprioritization of management actions to the SFA given the lack of state input and that the "conservation priorities may be misplaced as a result of policy-based, rather than science-based, planning." Nevada litigation, Motion for Summary Judgment, Case 3:15-cv-00491-MMD-VPC, Document 67 at 6 - 7, 04/01/16. The Nevada litigation record also reveals that the SFA designation did not reflect actual habitat conditions because BLM officials inappropriately "turned" lower priority habitat and non-habitat into SFAs: "The FEIS designated 2.8 million acres as SFA, which caused an additional 722,800 acres to be designated as PHMA, turned 436,000 acres of GHMA into PHMA, turned 211,100 acres of OHMA into PHMA, and turned 75,100 acres of non-habitat into PHMA." Nevada litigation, Order, Case 3:15-cv-00491-MMDVPC Document 126 at 37, 03/31/17. There are inconsistencies in the discussion of future management of the former SFA in the 2018 DEIS. The description in Table 2-2 on Page 2-8 states "Lands previously identified as SFA would be managed according to their underlying habitat management area designation (PHMA, GHMA, or OHMA…)". However, Pages 4-12, through 4-19 include text that implies that SFA would be automatically designated as PHMA: "[SFA] would still be managed according to their underlying Greater Sage Grouse habitat management area and associated allocations and management decisions (e.g., PHMA)." DEIS at 4-12. The DEIS needs to clarify that the SFA would be managed according to actual habitat characteristics based on site-specific, on-the-ground habitat data. The blanket, one-size-fits-all restrictions on mineral exploration and development, grazing, renewable and conventional energy development, transmission lines and pipelines, and access and travel in the SFA are inappropriate. Future land use restrictions on lands formerly designated as SFA must be applied surgically on a case-by-case basis based on actual, field-verified habitat conditions. Additionally, such restrictions, if warranted, cannot substantially interfere with claimants' rights under the Mining Law and FLPMA to explore for and develop minerals or to access and occupy public lands for mineral purposes.

1 1-2 P2 This section is not a correct characterization of the District Court Order. While designation of SFAs without the appropriate NEPA was a major issue the Order determined, the Order very clearly outlined the unlawfulness of designation of certain habitat designations without NEPA as well. For instance, the Order on p. 38 states that "[p]articular lands, no matter how few, that prior to publication of the FEIS were not subject to any type of management decision became subject to the most extreme of management decisions in the final Plan Amendments." The Order then focuses on habitat designation examples specific to Eureka County. Eureka County has NO SFA within the County. The closest SFA is roughly 200 miles away from the specific habitat changes the Court cites. Please revise the language to include the Court's Order about changes in habitat designations not being subject to NEPA, not just SFA, were unlawful. Or simply revise the first sentence in this paragraph to read "…by failing to prepare a supplemental EIS for certain habitat designation in the Nevada…"

Table 1-2, Row 2, Removing SFAs Please add a reference to the District Court of Nevada's Order.

Even though the Ely BLM District does not contain SFA designations, such designations in other BLM Districts will likely result in prioritizing critical/limited conservation efforts and funds (i.e. wildfire suppression and rehabilitation, wild horse gathers, etc.) away from the Ely District, which could be detrimental to both its Sage-grouse populations and land uses.

C.4.5 Habitat Objectives

Modifying Habitat Objectives No-Action Alternative: The County does not support this approach as it does not allow for incorporation of the best available science that has emerged since or will emerge after a ROD is signed. Additionally, the Habitat Objectives themselves are not achievable in all areas of GRSG range, particularly in those areas that have crossed an ecological threshold that prevents the site from being restored to pre-settlement ecological potential. Setting objectives that are not achievable violates the BLMs own planning handbook. l, The process does not include any explicit coordination with local agencies. BLM is required to also coordinate with local agencies. Local agencies often have imperative data and information for this process. Management Alignment Alternative: The County generally supports this Alternative and greatly appreciates the ability to incorporate best available science moving forward as well as the clarification regarding how objectives are to be viewed and implemented. The following suggested revisions are intended to strengthen this alternative. 1. The County would ask that the University of Nevada, Reno (UNR) College of Agriculture, Biotechnology and Natural Resources (CABNR) as well as UNR Cooperative Extension be added to the list for the science team as professionals from both entities possess important research experience and specific knowledge of the ecology found in the State of Nevada. 2. The County suggests adding two additional key components for developing site specific habitat objectives and those include: Disturbance Response Groups (DRGs) and the current ecological state of the site.

The language should be revised to make clear that adjustments should be made only if livestock grazing is a substantial causal factor in failing to meet rangeland health standards. As written, the language in the IMs provide for grazing adjustments regardless of the causal factor. In addition, as explained above, Habitat Objectives in Table 2-2 should not be rigidly applied as standards triggering adjustments to livestock grazing. BLM already has the authority under current grazing law to make immediate changes to livestock management if grazing management is deteriorating habitat. Additional thresholds that lack flexibility are unnecessary and unlawful.

Clarification of the habitat objectives table (2.2) can and should be achieved via policy & training. Measurable residuals at the end of the growing season must continue to be an objective. Improve livestock management through continued or increased emphasis on desired conditions rather than process/prescription.

Determination if GRSG habitat objectives are met (Table 2-2) The purported intent of Table 2-2 at page 2-18 of the LUPA in Nevada (as well as similar "Table 2-2" in the other LUPAs) is to set habitat objectives for sage-grouse habitat in various parts of the season, i.e. lek habitat, nesting/early brood rearing, late brood-rearing/summer, and winter. However, the LUPAs continually elevate these "objectives" to Standards, and in many cases, inflexible Standards. The variability between just these four states show that the best available science is not being used and applied in "Table 2-2". Specifically, the GRSG LUPA in (at least) Nevada include the following Objectives and Management Directions that demonstrate these flaws / consequences: Nevada Objective SSS 1: Manage land resource uses to meet GRSG habitat objectives, as described in Table 2-2. The habitat objectives will be used to evaluate management actions that are proposed in GRSG habitat. Managing for habitat objectives will ensure that habitat conditions are maintained if they are currently meeting objectives or if habitat conditions move toward these objectives in the event that current conditions do not meet these objectives. Nevada MD LG 5: If results from land health assessment indicate that GRSG habitat objectives (Table 2-2) are not met in SFA, PHMAs, or GHMAs and grazing is a casual factor, and until appropriate modifications (Nevada MD LG 1) are incorporated through the permit renewal process, implement management strategies that may include, but are not limited to, the following: 1. Provide periods of rest or deferment during critical growth periods of key vegetation species 2. Limit grazing duration and intensity to allow plant growth sufficient to meet GRSG habitat objectives (Table 2-2) 3. Employ herd management techniques to minimize impacts of livestock on breeding, nesting and brood-rearing habitat during the breeding season (March 1 to June 20; Lek - March 1 to May 15, and Nesting - April 1 to June 30) 4. Consider any temporary projects that can mitigate livestock impacts (e.g., temporary fencing or temporary water hauling locations; 5. Work with permittees to avoid concentrated turn-out locations for livestock within 4 miles of active and pending leks from March 1 to June 30 6. Avoid domestic sheep use and bedding areas and herder camps within 2 miles of active and pending leks from March 1 to June 30 7. Utilizing land features and roads on maps provided to the permittee to help delineate livestock use avoidance areas 8. Considering no grazing from May 15-Sept 15 in riparian areas and wet meadows 9. Removing livestock within 3-7 days for the remainder of ht grazing year once the allowable use levels are reached (BLM 199, Burton et. Al 2011, Cagney et. Al, 2010, Connelly et. Al 2000, France et. Al 2008, Hagen et. Al 2007, Holecheck 1988, Platts 1990, and Tanaka et. Al 2014): a. In riparian areas and wet meadows the allowable percent utilization is 35% woody species and a minimum stubble height of 4-6 inches for herbaceous riparian vegetation based on site b. In mountain big sage habitat, the allowable percent utilization is 40% herbaceous key species and/or 35% shrub key species c. In Wyoming Basin big sage habitat, the allowable percent utilization is 35% herbaceous key species and /or 35% shrub key species d. In black sage habitat, the allowable percent utilization is 35% herbaceous key species and/or 35% shrub key species. Nevada MD LG 6: Appropriate allowable utilization levels will be defined through the grazing permit renewal process. At least one alternative in the NEPA process will consider the utilization levels identified in (Nevada) MD LG 5. Nevada MD LG 8: Within PHMAs and GHMAs, incorporate terms and conditions into grazing permits to meet GRSG habitat objectives (Table 22), specific terms and conditions will be based on rangeland health assessments (and subsequent monitoring data). Nevada MD LG 10: In any allotment where land health standards were not met and livestock grazing was found to be a significant causal factor, compliance monitoring will be conducted annually

until GRSG habitat objectives (Table 2-2) are met. If compliance monitoring finds that the implemented management strategies identified in (Nevada) MD LG 5 are not achieving the desired results, a change in action will be required. Emphasis added. Issue #5, Recommendation 9: Any decision from this process would be to amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180. Issue 5: DEIS Comments 9: The DEIS, Table ES-3, at page ES-6, states that "Management Direction LG 5 (and references of these decisions in Management Decisions LG 6 and LG 10) within the existing ARMPA are inconsistent with 43 CFR 4160.1." This is read to assume that the DEIS agrees with our recommendation, i.e. the removal of such MD LG 5, 6, 8, 10. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the removal recommendation. In addition, we don't find that the DEIS addresses Nevada Objective SSS 1. It is critical that BLM consider carry forward our recommendation in the FEIS as to the removal of Objective SSS 1, and implement a proposed action in the ROD that adopts the removal (or significant modification) to Objective SSS 1. Issue #5, Recommendation 10: Variation in Table 2-2 needs to be addressed based on the best available science in all States. Table 2-2 needs to allow for variation not only on the ecological site but also: (a) state and transition models; (b) existing ecological condition; and (c) the ecological potential, given any state and transition. Issue 5: DEIS Comments 10: The DEIS at page 2-15 attempts to address this recommendation, stating that: "The Habitat Objectives table in the 2015 Final EIS would be revised to incorporate best available science in coordination with representatives from the SETT, USFWS, NDOW, CDFW, USFS, USGS, and BLM. The team would review and incorporate the best available science and would recommend adjustments based on regionally and locally derived data. As these habitat objects are updated, adjustments would be made by the BLM through plan maintenance. …" The Habitat Objectives table in the 2015 Final EIS are desired conditions that are broad goals based on habitat selection that may not be achievable in all areas. Objectives should be based on sources such as ecological site descriptions, associated state-and-transition models. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation. Issue #5, Recommendation 11: Nevada Objective SS1, Nevada MD LG 5, Nevada MD LG 6, Nevada MD LG 8, and Nevada MD LG 10 must be deleted or materially modified so any suggested prescriptions therein don't trump any decision-making (including NEPA) and appeal process, as prescribed in 43 C.F.R. Part 4100, subpart 4160. There is a suggestion in the language that BLM may unilaterally make changes without conformance to any decision-making process, simply only theory it is a land use plan requirement. See 43 C.F.R. 4100.0-8 (wherein the "authorized office shall manage livestock grazing … in accordance with applicable land use plans"). In addition, Nevada Objective SS1, Nevada MD LG 5, Nevada MD LG 6, Nevada MD LG 8, and Nevada MD LG 10 must be deleted or materially modified so any suggested monitoring is not mandatory per se. While we advocate for monitoring, we don't advocate for monitoring requirements that if not met, will result in premature and unwarranted litigation merely based upon the lack of monitoring, and not upon condition of the rangelands. In addition, Nevada Objective SS1, Nevada MD LG 5, Nevada MD LG 6, Nevada MD LG 8, and Nevada MD LG 10 must be deleted or materially modified so allowable use levels are not "defined" and otherwise mandatory per se. Management should be given the flexibility to implement a suite of actions to achieve applicable Standards and Objectives. Issue 5, DEIS Comment 11: See DEIS Comments 9.

Riparian issues - Nevada and Utah LUPAs. The LUPAs unwarrantedly elevate the impacts of livestock grazing in relation to Proper Functioning Condition or PFC. Specifically, the GRSG LUPA in (at least) Nevada includes the following Management Direction that demonstrates these flaws / consequences:

Nevada MD LG 12: Grazing management strategies for riparian areas and wet meadows will, at a minimum, maintain or achieve proper functioning condition (PFC) and promote GRSG brood-rearing habitat objectives (Table 2-2) within PHMAs and GHMAs. Issue #5, Recommendation 19: Any decision from this process would be amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180. See Issue #2. Issue 5: DEIS Comment 19: This recommendation is omitted for any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation. Issue #5, Recommendation 20: Rangeland health standards only require that significant progress is being made to achieve an applicable standard, like PFC; not that the standard be met. See 43 C.F.R. 4180.2(c). It is critical that any guidance language include "or, making significant progress towards" not just meeting PFC, as Section 4180.2(c) already requires. In addition, many "riparian areas" cannot make significant progress or cannot meet PFC with just grazing management, but require some artificial or mechanical means to restore an existing condition to allow the area any potential to achieve PFC. In addition, many other "riparian areas" cannot make significant progress or cannot meet PFC because they are subject, among other things: (1) to upstream activity beyond the management and control of the permittee and BLM; (2) to adjacent activity beyond the management or control of the permittee and/or BLM, like roads, recreational use, ATV use, etc.; (3) to livestock watering gaps or access points; (4) to normal or excess wild horse and burro use; or (5) to ditches and reservoirs authorized under pre-FLPMA Grants or FLPMA Rights-of-Way, wherein the purpose of the area is diverted for other, perhaps higher purposes, including, for example, municipal water supplies. The per se requirement to meet PFC is unwarranted and in many cases irrational. Issue 5: DEIS Comment 20: This recommendation is omitted for any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

Conserve all of the most important sage-grouse habitat. For example, winter habitat is particularly important to sage-grouse, mule deer and other wildlife, but the current federal plans fail to protect those areas from harmful land use and development. 2. Connect sage-grouse habitats. The federal government developed fifteen plans covering the sage-grouse's eleven-state range, but failed to stitch them together into a matrix that can provide for the species across federal jurisdictions and state boundaries. 3. Protect sagebrush reserves. It is important, particularly in light of climate change, that land managers set aside areas both where sage-grouse are now and where they will need to go in the future; the current conservation plans fail to provide that direction. Page 5 of 5 4. Reduce manageable impacts in sage-grouse habitat. Some threats to sage-grouse are difficult to manage, such as wildfire and invasive species. The federal conservation strategy should compensate for those impacts by emphasizing management of land uses that we can control, such as livestock grazing, which contributes to unnatural fire and the spread of invasive species. 5. Restore degraded sage-grouse habitat. Sage-grouse have already lost nearly half their range to agriculture and development. The federal sage-grouse conservation strategy should be updated to support active restoration of areas that can still be used by sage-grouse and other wildlife.

However, it is not correct to assume that one area occupied by one ROW provides suitable habitat for leks, early brood-rearing habitat, late brood-rearing habitat, and winter habitat. LCPD requests that habitat definitions be added to the RMPA/EIS so that the restrictions can be easily matched with the correct habitat types.

Modifying Habitat Objectives: The County does NOT support the "No Action Alternative" for the following reasons. The BLM must consider the grazing restrictions that may occur under Habitat Objectives Table 2-2 if implemented or interpreted incorrectly. Improper application of this Table will provide uncertainty with regard to seasonal livestock permits that have been active for decades and will also introduce management limitations to livestock operators (permittees), causing tangible harm to County residents. The economic impact is substantial to both livestock operators and the County since revenues are impacted when grazing is limited. The Humboldt County Master Plan, which provides the goals and objectives for the County, will be further compromised by Table 2-2, an impact which the BLM must consider. The goals set forth in that table must be considered relative to the ecological conditions and not as standards where, in some instances, they could never be attainable on certain lands. The County supports the "Management Alignment Alternative" with several suggested clarifications. Table 2-2 should be relabeled as Sage-Grouse Habitat "Goals" rather than "Objectives". Site specific objectives should be developed in consideration of site-specific ecological site descriptions, state and transition models and current ecological state of the subject site. The County appreciated inclusion of language already provided by the BLM in this regard. Further, the Table should be updated to be consistent with a similar table found in the State of Nevada Sage-grouse Conservation Plan. Any future adjustments should be based on best available science developed specific to the habitat and conditions found in Nevada, rather than other habitats located outside of the Great Basin.

1 1-9 Table 1-2, Row 7, Modifying Habitat Objectives NCA supports Bullet 1, and would suggest a minor addition, "…and current ecological state of the site." Add a bullet to read "Clarify that Habitat Objectives are actually desired outcomes expressed as goals (not truly objectives) consistent with BLM Planning Handbook (H- 1601-1) p. 12."

2-16 Table 2-2, Issue 7, Modifying Habitat Objectives No-Action Alternative: NCA does not support this approach as it does not allow for incorporation of the best available science that has emerged since or will emerge after a ROD is signed. Additionally, the Habitat Objectives themselves are not achievable in all areas of GRSG range, particularly in those areas that have crossed an ecological threshold that prevents the site from being restored to pre-settlement ecological potential. Setting objectives that are not achievable violates the BLMs own planning handbook. The process does not include any explicit coordination with local agencies. BLM is required to also coordinate with local agencies. Local agencies often have imperative data and information for this process. Management Alignment Alternative: NCA supports this alternative and greatly appreciates the ability to incorporate best available science moving forward as well as the clarification in paragraph 2 as to how objectives are to be viewed and implemented. NCA would ask that the University of Nevada, Reno (UNR) College of Agriculture, Biotechnology and Natural Resources (CABNR) as well as UNR Cooperative Extension be added to the list for the science team and professionals from both entities possess important professional knowledge as well as specific knowledge of the ecology found in the State of Nevada. NCA greatly appreciates and supports the inclusion of Paragraph 2 in this alternative, as this is the only way to properly develop site-specific and achievable objectives. NCA would suggest two additional key components for developing site specific habitat objectives and those include: Disturbance Response Groups (DRGs) and the current ecological state of the site. Please revise the second paragraph to read "Table 2-2 Habitat Objectives would be implemented following this guidance: Table 2-2 Habitat Objectives are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Site-specific objectives will be based on the site's ecological potential informed by ecological site descriptions and associated state-and-transition models and the site's current ecological state. The use of

Disturbance Response Groups may also be appropriate based on the scale of the particular project or application." NCA suggests adding a citation to the MOU that BLM and other federal agencies signed with NRCS regarding update and use of ESDs. The following references also support the use and application of these tools: BOLTZ, S., AND G. PEACOCK. 2002. Ecological sites: understanding the landscape. Rangelands 24:18-21. BRISKE, D.D., B.T. BESTELMEYER, T.K. STRINGHAM, AND P.L. SHAVER. 2008. Recommendations for development of resilience based state-and-transition models. Rangeland Ecology & Management 61:359-367. SOIL SURVEY DIVISION STAFF. 1993. Soil survey manual. Soil Conservation Service US Department of Agriculture Handbook 18. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, C. COOMBS, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models, Major Land Resource Area 28A and 28B Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-01. p. 1524. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models by disturbance response groups, Major Land Resource Area 25 Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-02:572. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, D. SNYDER, S. PETERSON AND K. SNYDER. 2016. Disturbance Response Grouping of Ecological Sites Increases Utility of Ecological Sites and State-and-Transition Models for Landscape Planning in the Great Basin. Rangelands 38(6):371-378.

3-3 Bullets 2 & 3 Please include better language about conifer encroachment so that it is recognized and addressed as the primary threat it is and so that the Habitat Objectives can be adjusted accordingly based on the best available science. While the EIS does specify previously omitted science related to pinyon/juniper and sage grouse avoidance, the EIS fails to identify that this science demonstrates a higher threat of conifer encroachment than previously recognized. Most importantly, this science directly refutes the Habitat Objectives in the No Action Alternative and justifies changes. For instance, the No Action Alternative Habitat Objectives call for <3% phase I for general habitat and <5% phase I for winter habitat. Phase I is defined in the ARMPA as 0 to 25% cover of trees. Yet, Baruch-Mordo et al. (2013) found that grouse abandon their leks at only 4% cover. USGS found this important enough to include in their synthesis even though it was prior to 2015. Other forthcoming or newly available research confirms NACO's position. Additionally, not specifically discussed in the EIS is reference to Severson et al. (which is in the USGS reports and discussed). Severson et al. concluded that "Despite conventional wisdom that female grouse are strongly tied to the same nesting sites every year, sage grouse hens were quick to consider restored habitat nearby, and nested both in and near sagebrush stands cleared of juniper. Within two to four years after juniper cutting, sage grouse moved in to cut areas, and the probability of nesting in and near treated sites increased 22% each year after cutting. After four years, the number of sage grouse nesting in and near the restored areas increased 29% (relative to the control area). Additionally, birds were much more likely to nest in or near restored sites: for every 0.6 miles from a cut area, the probability of nesting decreased 43%. In short, removing junipers dramatically increased the availability of nesting habitat, and hens proved quite willing to take advantage of good habitat as it became available" (as reported in Sage Grouse Initiative, Conifer Removal Boosts Sage Grouse Success, Science to Solutions Series Number 12, at 4 (2017)) Finally, Sandford et al. also reported in the afore mentioned Sage Grouse Initiative 2017: "[N]est success declined with every 0.6 miles farther away" from areas where trees were removed. "In one documented instance, a marked female nested within a treatment even before mechanical harvesters had completed the cut, and then successfully hatched a brood; Sandford et al. 2015" . . . "Most hens (86%) kept broods close to restored

habitats and avoided areas with trees, and hens that used areas cleared of conifers were most likely to successfully fledge their broods."

The BLM's sage-grouse plans are based on the best available science and responsibly balance energy development, recreation, grazing, and other activities on public lands. Major changes to the plans would undermine the progress that has been made to carefully ensure continued productivity of sagebrush habitat and allow for responsible development

TNC recommends that BLM provide Instruction Memoranda or other guidance to field offices to assist in implementation of the tables which clearly state that habitat objectives are to be based on the site's ecological potential and local variability. The lack of clear guidance has led to misunderstandings regarding decisions which should be based on site-specific conditions. This guidance should clarify that: ? No lands are closed to grazing in the grouse plans.73 ? Achieving habitat objectives for vegetation (such as grass or forb height) will be evaluated based on a specific site's ability to meet those conditions, using the best available science. TNC also recognizes that two recent studies have raised serious questions about the link between grass- height and nesting success.74 TNC recommends following the best available science to address this emerging finding. Clarify the process for adjusting the Habitat Management Boundaries All the 2018 DEIS except the one for Oregon include provisions for adjustment of sage-grouse habitat management boundaries.75 We support transparent and consistent science-based efforts to ensure that any habitat management boundaries changes (1) represent the most available up-to-date and accurate 71 Id., p. 2-4; see also, NTT Report at 15 "Manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve sage-grouse seasonal habitat objectives"). This portion of the NTT Report is referenced favorably in FWS 2015 Greater Sage-grouse Listing Decision, 80 Federal Register at 59872. 72 Bureau of Land Management Idaho and Southwestern Montana. Greater Sage-Grouse Approved Resource Management Plan Amendment (September 2015), Table 2-2, pp. 2-5 to 2-6 (Idaho BLM plan). https://eplanning.blm.gov/epl-front-office/projects/lup/31652/63338/68680/IDMT_ARMPA_web.pdf 73 See e.g., Idaho BLM Plan, Table 2-1, p. 2-3; Wyoming BLM plan, Table 2-1, p. 26. 74 Gibson et, al., Evaluating vegetation effects on animal demographics: the role of plant phenology and sampling bias. Ecology and Evolution (2016). 6(11), 3621-3631. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4848082/; Smith JT, Tack JD, Doherty KE, et al. Phenology largely explains taller grass at successful nests in greater sage- grouse. Ecol Evol. 2017;00:1-9. https://doi.org/10.1002/ece3.3679 (Viewed in total, evidence for a ubiquitous biological effect of grass height on sage-grouse nest success across time and space is lacking). 75 See Bureau of Land Management. Idaho Greater Sage-Grouse Draft Resources Management Plan Amendment and Environmental Impact Statement (May 2018) at pp. 2-7, 2-26-27; Bureau of Land Management. Nevada and Northeastern California Greater Sage-Grouse Draft Resources Management Plan Amendment and Environmental Impact Statement (May 2018) at pp. 2-6-7; Bureau of Land Management. Northwest Colorado Greater Sage- Grouse Draft Resources Management Plan Amendment and Environmental Impact Statement (May 2018) at pp. 1- 9, Appendix H.4.3; Bureau of Land Management. Utah Greater Sage-Grouse Draft Resources Management Plan Amendment and Environmental Impact Statement (May 2018) at pp.at 2-7, 2-31-32, Appendix K (2018 Utah DEIS); Bureau of Land Management. Wyoming Greater Sage-Grouse Draft Resources Management Plan Amendment and Environmental Impact Statement (May 2018) at p. 2-5. Detailed Comments on NV-CA DEIS The Nature Conservancy 22 of 23 information; and (2) do the most effective job possible of conserving sage-grouse habitat, and do not result in a meaningful decrease in the current level of conservation provided by the 2015 sage-grouse land use plans.

Table 2.2 of the 2015 RMPA is not consistent with the Nevada State Plan descriptions of habitat at the site level. The DRMPA does not, but the RMPA should, make clear that the objective landscape habitat descriptions are as described in the State Plan, and that Table 2-2 of the 2015 RMPA is deleted.

ES-3.1 ES-4 Table ES-2 For "Modifying Habitat Objectives", Bullet 1, this sentence should include "…as well as the current ecological state of the site".

2 2-15 & 16 Table 2-2, Issue 7, Modifying Habitat Objectives No-Action Alternative: NACO does not support this approach as it does not allow for incorporation of the best available science that has emerged since or will emerge after a ROD is signed. See County Needs Attachment for specific examples, with special attention towards the information regarding Pinyon and Juniper encroachment mapped as habitat from Churchill and Lander Counties. Additionally, the Habitat Objectives themselves are not achievable in all areas of GRSG range, particularly in those areas that have crossed an ecological threshold that prevents the site from being restored to pre-settlement ecological potential. Setting objectives that are not achievable violates the BLMs own planning handbook. The process does not include any explicit coordination with local agencies. BLM is required to also coordinate with local agencies. Local agencies often have imperative data and information for this process. Management Alignment Alternative: NACO generally supports this alternative and greatly appreciates the ability to incorporate best available science moving forward as well as the clarification in paragraph 2 as to how objectives are to be viewed and implemented. The following suggested revisions are intended to strengthen this alternative. NACO would ask that the University of Nevada, Reno (UNR) College of Agriculture, Biotechnology and Natural Resources (CABNR) as well as UNR Cooperative Extension be added to the list for the science team and professionals from both entities possess important professional knowledge as well as specific knowledge of the ecology found in the State of Nevada. While NACO appreciates having the ability to incorporate changes through "plan maintenance," for the same reasons stated in several locations above NACO suggests adding "or through a plan amendment as appropriate." NACO greatly appreciates and support the inclusion of Paragraph 2 in this alternative as this is the only way to properly develop site-specific and achievable objectives. NACO suggests adding two additional key components for developing site specific habitat objectives and those include: Disturbance Response Groups (DRGs) and the current ecological state of the site. Please revise the second paragraph to read "Table 2-2 Habitat Objectives would be implemented following this guidance: Table 2-2 Habitat Objectives are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Site-specific objectives will be based on the site's ecological potential informed by ecological site descriptions and associated state-and-transition models and the site's current ecological state. The use of Disturbance Response Groups may also be appropriate based on the scale of the particular project or application." NACO also suggests adding a citation to the MOU that BLM and other federal agencies signed with NRCS regarding update and use of ESDs. The following references also support the use and application of these tools: * BOLTZ, S., AND G. PEACOCK. 2002. Ecological sites: understanding the landscape. Rangelands 24:18-21. * BRISKE, D.D., B.T. BESTELMEYER, T.K. STRINGHAM, AND P.L. SHAVER. 2008. Recommendations for development of resilience based state-and-transition models. Rangeland Ecology & Management 61:359-367. * SOIL SURVEY DIVISION STAFF. 1993. Soil survey manual. Soil Conservation Service US Department of Agriculture Handbook 18. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, C. COOMBS, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models, Major Land Resource Area 28A and 28B Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-01. p. 1524. Available at:

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NACO suggests adding two additional key components for developing site specific habitat objectives and those include: Disturbance Response Groups (DRGs) and the current ecological state of the site. Please revise the second paragraph to read "Table 2-2 Habitat Objectives would be implemented following this guidance: Table 2-2 Habitat Objectives are desired habitat conditions that are broad goals based on habitat selection that may not be achievable in all areas. Site-specific objectives will be based on the site's ecological potential informed by ecological site descriptions and associated state-and-transition models and the site's current ecological state. The use of Disturbance Response Groups may also be appropriate based on the scale of the particular project or application." NACO also suggests adding a citation to the MOU that BLM and other federal agencies signed with NRCS regarding update and use of ESDs. The following references also support the use and application of these tools: * BOLTZ, S., AND G. PEACOCK. 2002. Ecological sites: understanding the landscape. Rangelands 24:18-21. * BRISKE, D.D., B.T. BESTELMEYER, T.K. STRINGHAM, AND P.L. SHAVER. 2008. Recommendations for development of resilience based state-and-transition models. Rangeland Ecology & Management 61:359-367. * SOIL SURVEY DIVISION STAFF. 1993. Soil survey manual. Soil Conservation Service US Department of Agriculture Handbook 18. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, C. COOMBS, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models, Major Land Resource Area 28A and 28B Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-01. p. 1524. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. * STRINGHAM, T.K., P. NOVAK-ECHENIQUE, P. BLACKBURN, D. SNYDER, AND A. WARTGOW. 2015. Final report for USDA ecological site description state-and-transition models by disturbance response groups, Major Land Resource Area 25 Nevada. University of Nevada Reno, Nevada Agricultural Experiment Station Research Report 2015-02:572. Available at: http://www.cabnr.unr.edu/resources/MLRA.aspx. STRINGHAM, T.K., P. NOVAK-ECHENIQUE, D. SNYDER, S. PETERSON AND K. SNYDER. 2016. Disturbance Response Grouping of Ecological Sites Increases Utility of Ecological Sites and State-and-Transition Models for Landscape Planning in the Great Basin. Rangelands 38(6):371-378.

3-2 8 Change "measures" to "indicators." Indicators inform, measures measure. 3 3-2 Bullet 2 NACO has concern with the following statement, "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late brood-rearing across all sites" and replace with "selection and positive survival relationships with vegetation (grass and shrub) cover during nesting and late brood-rearing across still exist. Evidence for a ubiquitous positive relation between grass height and nest success was either greatly diminished (Gibson and others, 2016a) or not supported (Smith and others, 2017b), although some studies that corrected for phenology still support this relation (Smith and others, 2017b; Coates and others, 2017a). Indicator values for grass height need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors and are geographically

appropriate." The second bullet mischaracterizes Gipson et al (2016) and links Gipson to the conclusion that "the authors found strong selection and positive survival for high horizontal cover and total shrub cover during nesting and late brood-rearing across all sites." Yet, the USGS points out many studies that do not necessarily make this conclusion. USGS explicitly states that "Indicator values for grass height contained in the habitat objectives tables of the 2015 BLM land use plans…may need to be examined to ensure they have not been derived from studies using vegetation data collected at different times for successful and unsuccessful nests without applying correction factors (Gibson and others, 2016a) and that science findings are geographically appropriate." Examples referenced and discussed by USGS include Gipson et al. (2016) and Smith et al. (2017). Gibson et al. (2016), concluded that "the correlation between grass height and nest success could instead be due to a built in bias in timing of when vegetation is measured around hatched and failed nests. If habitat measurements are made immediately after researchers determine fate of a nest (either failure or hatch), measurements may be taken weeks later at successful nests than at failed nests, which allows grasses more time to grow. Because the nesting season occurs in the spring during green-up - when grasses can grow more than a half an inch a week - it appears that hatched nests are surrounded by taller grass. Dr. Gibson's study suggested this timing bias is the reason that so many studies have concluded that tall grass is important for concealing nests from predators" (as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height Measurements, Science to Solutions Series Number 15, at 4 (2017)). Smith et al. (2017) "re-analyzed data from three independent studies that previously showed a correlation between grass height and nest success. Smith and his team reevaluated data from studies in the Powder River Basin of southeast Montana and northeast Wyoming (Doherty study), Smith's own research in central Montana, and a site in northeast Utah. When combined with Gibson's research in Nevada, the studies encompassed 1,204 sage grouse nests over 24 study site years from across the range of sage grouse. In Gibson's study, measurements of vegetation were made at the expected hatch date for all nests, regardless of their actual outcome. This minimized any difference between failed and hatched nests in when vegetation was measured. Gibson then used a linear regression to predict vegetation height at the date of nest fate, simulating the biased methods common in other sage grouse nesting studies. For his study, Smith used the data that was collected at nest fate - the biased way - and applied the reverse correction to obtain grass heights as though they had been sampled using unbiased methods. Smith found that, when uncorrected, all of the datasets revealed a strong correlation between grass height and nest success. However, following the simple correction to account for bias, there was no longer any association between grass height and nest success in two of the three studies, while the association was slightly reduced in strength but still apparent in the third Powder River Basin. At hatch date, median grass heights at hatched and failed nests were within just 0.05 inches of one another across all re-analyzed datasets. Overall, the research strongly affirmed Gibson's initial findings and suggests that the height of grass is not nearly as crucial to sage grouse nesting success as previously thought" (also as discussed in Sage Grouse Initiative, Taking the Bias Out of Grass Height Measurements, Science to Solutions Series Number 15, at 4 (2017)) 3 3-3 Bullets 2 & 3 Please include better language about conifer encroachment so that it is recognized and addressed as the primary threat it is and so that the Habitat Objectives can be adjusted accordingly based on the best available science. While the EIS does specify previously omitted science related to pinyon/juniper and sage grouse avoidance, the EIS fails to identify that this science demonstrate a higher threat of conifer encroachment than previously recognized. Most importantly, this science directly refutes the Habitat Objectives in the No Action Alternative and justifies changes. For instance, the No Action Alternative Habitat Objectives call for <3% phase I for general habitat and <5% phase 1 for winter habitat. Phase I is defined in the ARMPA as 0 to 25% cover of trees. Yet, Baruch-Mordo et al. (2013) found that grouse abandon their leks at only 4% cover. USGS

found this important enough to include in their synthesis even though it was prior to 2015. Other forthcoming or newly available research confirms NACO's position. Additionally, not specifically discussed in the EIS is reference to Severson et al. (which is in the USGS reports and discussed). Severson et al. concluded that "Despite conventional wisdom that female grouse are strongly tied to the same nesting sites every year, sage grouse hens were quick to consider restored habitat nearby, and nested both in and near sagebrush stands cleared of juniper. Within two to four years after juniper cutting, sage grouse moved in to cut areas, and the probability of nesting in and near treated sites increased 22% each year after cutting. After four years, the number of sage grouse nesting in and near the restored areas increased 29% (relative to the control area). Additionally, birds were much more likely to nest in or near restored sites: for every 0.6 miles from a cut area, the probability of nesting decreased 43%. In short, removing junipers dramatically increased the availability of nesting habitat, and hens proved quite willing to take advantage of good habitat as it became available" (as reported in Sage Grouse Initiative, Conifer Removal Boosts Sage Grouse Success, Science to Solutions Series Number 12, at 4 (2017)) Finally, Sandford et al. also reported in the aforementioned Sage Grouse Initiative 2017: "[N]est success declined with every 0.6 miles farther away" from areas where trees were removed. "In one documented instance, a marked female nested within a treatment even before mechanical harvesters had completed the cut, and then successfully hatched a brood; Sandford et al. 2015" . . . "Most hens (86%) kept broods close to restored habitats and avoided areas with trees, and hens that used areas cleared of conifers were most likely to successfully fledge their broods."

ES-3.1 ES-3 Table ES-2 For "Modifying Habitat Management Area Designations" it should be made clear here and throughout the document that the mapping is based on habitat and use modeling that is continually evolving through incorporation of new data and information. This better sets the context for the need to "adjust" HMA Categories now and into the future. ES-3.1 ES-4 Table ES-2 For "Modifying Habitat Objectives", Bullet 1, this sentence should include "…as well as the current ecological state of the site".

The BLM must consider the grazing restrictions that may occur under Habitat Objectives Table 2-2 if implemented or interpreted incorrectly.

BLM ought to broaden the stakeholders with whom it coordinates during this process. As with the Adaptive Management Plan process, we urge the BLM to consult the University of California and University of Nevada in evaluation of best available science and to include local land and resource users within the process of modifying habitat objectives.

Site specific objectives should be developed in consideration of site-specific ecological site descriptions, state and transition models and current ecological state of the subject site.

C.4.6 Adaptive Management

Adaptive Management Based on the discussion at the July 17, 2018 Sagebrush Ecosystem Council meeting, it is clear that BLM's adaptive management procedures are not effective at preventing or minimizing wildfire risks in northern Nevada. Several people commented that the fire risks in the area that was burned in the July 2018 Martin Fire in Humboldt and Elko Counties, Nevada were well known and included areas of cheatgrass invasion where targeted, managed grazing could have reduced the flammable fuel load comprised of annual grasses. The area also had a significant buildup of woody-fuel comprised of sagebrush that provided GSG habitat. The Martin Fire burned approximately 26 million

acres of GSG habitat which was comprised of 12 million acres of PHMA, 8 million acres of GHMA, and 6 million acres of OHMA. Most of the burned acres in this fire affect BLM-administered lands. Because wildfire is the greatest threat to GSG and its habitat in Nevada, BLM's adaptive management procedures should focus more on pre-fire measures that reduce wildfire risks. The adaptive management provisions in Appendix D of the 2018 DEIS are not proactive because they focus on problems that have already happened (e.g., population declines and habitat loss) but they do not minimize risks due to wildfire which cause devastating habitat loss. PGC disagrees with BLM's position that "Adaptive management, with specific triggers (signals), provide additional certainty that the regulatory mechanisms included in the WPA are robust and able to respond to a variety of conditions and circumstances quickly and effectively to conserve Greater Sage-Grouse habitat and populations." (DEIS at D-1).

Because wildfire is the greatest threat to GSG and its habitat in Nevada, BLM's adaptive management procedures should focus more on pre-fire measures that reduce wildfire risks. The adaptive management provisions in Appendix D of the 2018 DEIS are not proactive because they focus on problems that have already happened (e.g., population declines and habitat loss) but they do not minimize risks due to wildfire which cause devastating habitat loss. PGC disagrees with BLM's position that "Adaptive management, with specific triggers (signals), provide additional certainty that the regulatory mechanisms included in the WPA are robust and able to respond to a variety of conditions and circumstances quickly and effectively to conserve Greater Sage-Grouse habitat and populations." (DEIS at D-1). Unfortunately, as proven in the case of the Martin Fire, BLM's adaptive management policies are not effective at preventing catastrophic wildfire and the concomitant enormous loss of GSG habitat. The adaptive management measures need to be revised to provide BLM with the necessary flexibility and nimbleness to implement site-specific measures to reduce identified wildfire risks. If this means that some fuel reduction is warranted in GSG habitat areas in order to reduce wildfire risks, BLM should be authorized to implement appropriate measures to minimize the buildup of flammable fuels. Fuel reduction activities that impact selected habitat areas is a far preferable outcome to losing over 26 million acres of habitat as occurred in the Martin fire. Additionally, there are a number of provisions in the adaptive management protocols in Appendix D that cannot be applied to mineral projects because they are not consistent with claimants' rights pursuant to FLPMA and the U.S. Mining Law. Appendix D needs to be modified to clarify that the following adaptive management triggers (DEIS at D-6) do not apply to mining projects: Delaying issuance of new permits and authorizations; Delaying issuance of new or pending ROWs outside of designated existing corridors; Increasing enforcement efforts on travel restrictions; Limiting noise and/or light pollution; Temporary closures; and Eliminating allocation exception decisions in areas that have tripped a hard trigger. These measures have the potential to substantially interfere with a claimant's rights under FLPMA and the U.S. Mining Law. Consequently, they cannot be applied indiscriminately to mineral exploration and development projects. It may be possible to mitigate concerns about travel and noise and light pollution at some mineral projects based on project-specific circumstances. However, permit delays and temporary closures are not consistent with FLPMA and the U.S. Mining Law, which provide for ingress and egress and use and occupancy of public lands for mineral purposes. They are also inconsistent with the Executive and Secretarial Orders discussed in Section 11B.

Habitat analysis can be impacted by several factors including weather and the availability of qualified assessors. In Appendix D, page 4, what are the implications if triggers are not identified within the stated time frame?

In Appendix D, page 5, local partners must be included in the causal factor analysis and management response. This may include mining operators on public lands, grazing permittees and county resource advisors.

Adaptive Management No-Action Alternative: The Adaptive Management Framework described in the No-Action Alternative and contained in Appendix J of the current LUPA is not Adaptive Management as described by the DOI's own guidance document; see Figure 1.1 below from DOI, 2009. Figure Diagram of the adaptive management process. This is particularly true of the hard trigger response that automatically implements a host of allocation decisions that may or may not be warranted based on the cause of reaching a hard trigger. Once the hard trigger responses are implemented there is no iterative implementation or path for reversing those automatic implementations. The scale of the response is also not well defined. The BLM should reject the No-Action Alternative, and ensure that all Adaptive Management Process components listed in Figure 1.1 above are incorporated into the Management Alignment Alternative, and Appendix D of that document. Management Alignment Alternative: The County supports the BLM's adoption of the State's Adaptive Management Plan as approved by the Sagebrush Ecosystem Council at its July 17, 2018 meeting.

BLM must reaffirm its commitment to implementing and enforcing a transparent adaptive management strategy. Our concerns for proposed changes to the adaptive management strategy are twofold: (1) BLM appears to be watering down the commitment to implementing immediate corrective actions for "hard triggers;" and (2) BLM is preparing to adopt the State of Nevada's adaptive management strategy, in lieu of the strategy set forth in the BLM plan, without any sort of detailed analysis or public input.

First, the 2015 ARMPA established criteria for addressing future degradation of Greater sage-grouse habitat and populations. When a specific habitat area, or a specific population, experiences a significant decline, the RMP "triggers" certain land management responses. A soft trigger would be reached if, when an authorized project is implemented, the results of population monitoring reveal there is a decrease in male attendance at a lek in the project area, as compared to adjacent or trend leks. This would initiate a project design response and require modification of, or additional mitigation to, the project. … Hard triggers represent a threshold indicating that immediate action is necessary to stop a severe deviation from GRSG conservation goals and objectives, as set forth in the BLM and Forest Service plans. NV/CA ARMPA at J-4. In response to triggering events, the 2015 ARMPA directed BLM managers to take specific action in response to degradation of habitat. For example, for oil and gas development, there are normally two exceptions for NSO in PHMA. But in the event of a "hard trigger," no further exceptions to NSO in PHMA would be allowed. Id. at J-8. Those hard triggers created certainty in the plans that BLM would immediately address significant degradation of habitat through specific and certain action. But in the Draft EIS, BLM is inserting uncertainty into the decision-making process for "hard triggers." For example, BLM states that "[t]ripping a soft and/or hard trigger (signal) will initiate a local-state-federal interagency dialogue to evaluate causal factors and recommend adjustments to implementation level activities to reverse the trend." NV/CA Draft EIS at D-1. This statement suggests that immediate, corrective action will not be taken, which is required under the 2015 ARMPA. Further, while the 2015 ARMPA contained a specific list of actions that BLM would take when "hard triggers" were reached, the Draft EIS lacks such a list. Consequently, it is unclear what, if any, immediate action BLM would take in response to "hard triggers."Second, in the Draft EIS, BLM states that it "would consider alignment with the State's [adaptive management] strategy when it is completed." NV/CA Draft EIS at 2-9. There is no further information provided about the state's strategy, however. Thus, to the extent that BLM does

move forward with consideration of the state's strategy, it must do so through a plan amendment and open and transparent public process. BLM may not utilize plan maintenance, given that BLM has not previously evaluated the state's strategy and "[s]uch maintenance [would not be] limited to further refining or documenting a previously approved decision incorporated in the plan." 43 C.F.R. § 1610.5-4.

2-8 Table 2-2 Adaptive Management It is imperative that local partners and stakeholders are involved in the causal factor analysis. These individuals represent and exemplify the most accurate, time-tested, on-the-ground working knowledge, and year-in year-out experience regarding the areas in question.

Improve plan monitoring and oversight, including providing training to field staff and the necessary incentives to ensure proper implementation. The plans should contain metrics by which conservation success can be measured. Conservation metrics will help in effective management of the habitat and reduce wasting personnel time and limited funds.

We would like to highlight the Adaptive Management presented in the draft, as well. Soft and hard triggers would be used to monitor disturbances under the No-Action Alternative. Once a soft trigger is reached under this alternative, the Bureau would identify the causal factor and apply adaptive management to alleviate the causes of the decline in populations or habitat quality. Also, the Greater Sage-Grouse populations and its habitat would be monitored annually, and if the causal factor is not readily discernible, an interdisciplinary team would identify the appropriate mitigation or management actions in a timely manner. Now if a hard trigger is reached under the No-Action Alternative, the WAFWA Management Zone Greater Sage-Grouse Conservation Team would determine the cause, project level responses, and investigate the appropriate response. Then a plan amendment process may be initiated as a response. On the other hand, the Preferred Management Alignment Alternative completely revises soft and hard population triggers in accordance USGS's Hierarchical Population Monitoring of Greater Sage-Grouse in Nevada and California-Identifying Populations of Management at the Appropriate Spatial Scale. Also, the Bureau's Adaptive Management will incorporate elements of the Nevada's Conservation Plan, and the established triggers will be removed when recovery criteria has been met. The revision, and potential removal, of the triggers under the preferred alternative can leave the Greater Sage-Grouse and its habitat vulnerable to the consequences of mineral development. The Bureau's preferred alternative does not possess a strong enough threshold to gage how the Greater Sage-Grouse is doing in the area. As a result, this will weaken the Bureau's response to any declines in the population and habitat. American Bird Conservancy views an Adaptive Management that includes triggers and is run in accordance with the conservation alternative as a way to improve protection of the Greater Sage-Grouse and its habitat.

WEX greatly appreciates and strongly supports the BLM's inclusion of adaptive management processes which provide flexibility for multiple land uses as presented in the Management Alignment Alternative. Replacement of predetermined hard trigger responses with a clear causal factor analysis process to determine appropriate management responses is more effective and more consistent with FLPMA. Revising and simplifying the allocation exception process also is consistent with FLPMA to help ensure a balance management for multiple-use and due consideration of site specific information, existing disturbance and accommodation of responsible development. Unlike the improper and unlawful outright prohibitions in the land designations included in the 2015 NVLMP and now the No Action Alternative, the land use designation included under the Management Alignment Alternative provide for

consideration of proper multiple-use issues, site specific information and appropriate mitigation measures under the allocation exception process.

Adaptive Management: The County does NOT support the "No Action Alternative" for the following reasons. Simply put, the process included in Appendix D of the 2015 LUP is NOT Adaptive Management. The No Action Alternative is inconsistent with the Department of Interior's (DOI's) Adaptive Management Implementation Policy (522 DM 1), as well as DOI's Adaptive Management Technical Guide published in 2009). The process is not iterative, does not include a diverse set of interested stakeholders (i.e. local government) and has no clear means of removing 'triggered" allocation decisions. As such, the County could realize great harm in implementation of this process as additional regulations and restrictions could be placed on the County itself, as well as the public land uses and resources that it heavily relies upon to support its customs, culture and economy as described in the County Master Plan. As such, the No Action Alternative is inconsistent with both the DOI's own guidance and the County's Master Plan.

The County supports the "Management Alignment Alternative" with several suggested clarifications. The County appreciates that this alternative better follows DOI guidance, as well as the process described in its 2009 Adaptive Management Technical Guide. The County suggests a stronger emphasis of inclusion of local partners (County government, conservation districts, NGOs and affected land users) for any casual factor analysis, Adaptive Management process and/or planning effort. The County agrees that a causal factor analysis should be completed before implementation of any additional land use regulations or restrictions. The County also questions the use of "Habitat Soft and Hard Triggers" that are included in the DEIS and suggests removal of these triggers unless a more robust, scientific justification can be provided for their use. Finally, the County questions how Adaptive Management will be implemented in BSI-J and/or Lek Cluster areas that fall outside of mapped habitat adopted by the Nevada Sagebrush Ecosystem Council in 2015. The BSI-JS and Lek Clusters should be reconfigured to match the 2015 state-approved mapping.

1 1-8 Table 1-2, Row 3, Adaptive Management We appreciate the effort of the BLM to be more consistent with DOI Guidance on Adaptive Management, and also the inclusion of "local partners" throughout the process. Add a bullet to read "Utilize collaborative and consensus based processes with stakeholders, appropriate state and local agencies, and authorized land uses when developing and implementing management responses to any signal/trigger met or surpassed."

Chapter 2 2 2-8 and 29 Table 2-2, Issue 3, Adaptive Management No-Action Alternative: The Adaptive Management Framework described in No-Action Alternative and contained in Appendix J of the current LUPA is NOT Adaptive Management as described by the DOIs own guidance document 2009. This is particularly true of the Hard Trigger response that automatically implements a host of allocation decisions that may or may not be warranted based on the cause of reaching a hard trigger. Once the hard trigger responses are implemented there is no iterative implementation or path for reversing those automatic implementations. The scale of the response is also not well defined. Particular aspects of the Adaptive Management Approach not included that are currently under No-Action Alternative, and as described in DOI 2009 include: Assessment of Problem (particularly on Hard Trigger Response as there is no casual factor analysis); Design (particularly on Hard Trigger Response as responses are "hard wired" in at the RMP level); Monitor; Evaluate; and, Adjust As such, the BLM should reject No-Action

Alternative, and ensure that all Adaptive Management Process components from DOI 2009 are incorporated into Management Alignment Alternative, and Appendix D of this document.

2-8 Table 2-2, Issue 3, Adaptive Management NCA appreciates BLMs deference to the State's development of an updated Adaptive Management Strategy. NCA is especially supportive of a recently added trigger in the State Plan dealing with excessive fuel loading. NCA requests that the Adaptive Management Strategy of the State be fully implemented including addressing excessive fuel loading to aid in proactively addressing the wildfire threat to habitat.

Appendix D D-5 & 6 Step 2 & 3 The following questions should be added to the list: What is the appropriate casual factor analysis area and response area? Is recovery of the habitat and/or population(s) achievable? What responses (management actions), not included in the LUPA, may accelerate recovery and what subsequent NEPA actions need to be taken to ensure timely implementation? What are the appropriate (implementable at an appropriate scale and on an appropriate timeframe) responses (management actions) and the anticipated results of such responses? It should be noted that DOI 2009 clearly states that the 'modeled' or 'anticipated' outcome of management actions should be clearly articulated in order to monitor and evaluate if such anticipated results are achieved. What is the monitoring protocol, responsibilities and reporting requirement associated with each response? What are the anticipated adaptive management changes to the initial responses if they don't achieve desired outcomes?

Appendix D D-5 & 6 Step 3 This step starts out by saying that "…the BLM will also identify the appropriate trigger responses that will be applied to the lek cluster and/or BSU that has tripped a trigger." This approach is not consistent with the stakeholder approach described in DOI 2009. As such, NCA suggests revising this language to read "…the stakeholder group assembled to complete the casual factor analysis will identify the appropriate responses that will be applied and which of those are within the BLMs authority under the LUPA, which may require tiered or supplemental NEPA analysis, and which of those may fall under the stakeholder's authority to implement".

Appendix D D-6 Step 3 The BLM identifies a list of response actions that it "could" evaluate. Again, this list should be developed with the stakeholder group, and the following actions should be added to the list: Implementation of emergency burn rehabilitation and/or emergency hazard fuels reduction; Development of a Grazing Allotment Management Plan; Development of a targeted grazing plan; Prioritize habitat improvement projects and associated implementation funding; Work with partners to identify and implement appropriate predator control measures (particularly if such efforts are warranted while habitat recovers from a catastrophic event); Emergency gather of Wild Horses and Burros; Work with existing water right holders to make water available for rehabilitation effort, or to develop range improvements to enhance and protect critical water resources.

Appendix D D-6 Step 3 A response plan should be developed for either a soft or hard trigger unless the stakeholder team assembled to develop the causal factor analysis determines that such a plan is not warranted. If a plan is warranted, it should include information pertinent to all phases of an adaptive management approach (see DOI, 2009), but, in particular, there needs to be inclusion of the anticipated response to response actions, a monitoring component for each response and a discussion of how response will be adjusted based on monitoring.

Appendix D D-6 Step 4 The scale of response should be identified by the stakeholder team assembled to develop the causal factor analysis. While the BLM may be responsible for implementing some of the responses identified by the stakeholder team, other stakeholders may also have implementation responsibilities (i.e. a grazing permittee developing an AUM, a wildlife agency providing implementation funding for a rehabilitation project, etc.). Appendix D D-6 & 7 Step 5 NCA would advocate for biological monitoring to be completed and that all monitoring (biological and/or habitat) should be collaborative among the stakeholder team to encourage buy-in and accountability. Appendix D D-7 Longevity of Trigger Responses This should be identified in development of the Response Plan by the stakeholder group based on the casual factor analysis and response plan.

ADAPTIVE MANAGEMENT Appendix D is apparently a re-write of Appendix J in the 2015 FEIS. Sadly, the re-write is internally inconsistent and seems less concerned with evolving science than the 2015 version. The following examples show this move from a process anchored in scientific research to a reliance on experts, and less trust/engagement of the public: · As stated in the text: In Appendix J (2015) hard triggers could be determined by the appearance of collective soft triggers, whereas in Appendix D (2018) only accelerated criteria are used for hard triggers. · Appendix D (2018) does not refer to the methodologies for collecting data on population that were provided in Appendix J (2015). Instead of data collection as described in Appendix E (2015), responsibility for establishing population counts are delegated to the state agencies and the National Operations Center. · For habitat data (sagebrush coverage), text in Appendix D (2018) specifically refers to "imagery" though it is well documented that there are many difficulties in interpreting satellite imagery accurately and this specification suggests that new technologies won't be acceptable, if developed. · Appendix J (2015) refers to the cutting-edge work being done on genetic studies and accounting for the use of alternative leks by Greater sage-grouse, but Appendix D (2018) does not. Fedy and Aldredige 2011 cited in Appendix J (2015) is not mentioned in Appendix D (2108).

Appendix D (2108) eliminates the concepts of "seasonal habitat" and "space-use models" incorporated into the analyses recommended in Appendix J (2015).

The number of biologically significant units (BSU) have been reduced from 17 in Appendix J (2015) to only 7 in Appendix D (2018). While this may be an appropriate change, there is no reference to indicate who changed the units or why. Neither Appendix J (2015) or Appendix D (2018) have provided reference lists. For Appendix D (2018) there are four references (fewer than the seven in Appendix J). The following citations need full references to make the appendix of use to the public: Coates et al. 2017; DOI 2008; Stiver et al. 2015; and BLM 2015. The following references were dropped from Appendix J (2015) that likely would add significant science to the process: Coates et al. 2014 (updated by 2017?); and Connelly 2004; DOI 2008; Fedy and Aldridge 2011; Stiver 2006 (updated by 2015?); and USFWS 2013. Coates et al. 2017 is mentioned numerous (5) times and appears to be the backbone of Appendix D (2018). However, nowhere in the appendix is the reader given a title or co-authors to help determine which of the 7 papers authored by Coates in 2017 are being invoked (at least four have Greater sage-grouse in the title). The reference list for the 2018 EIS in general may have the proper reference but again, Coates was involved in numerous publications (BTW the reference list does not have Coates et al. 2017a though it is referred to in the text, pages 3-2 and 3-3). There is no mention of the EIS reference list in this appendix text to direct the reader to consult it. Previous efforts to identify sources mentioned within the EIS (2015) have found that the reference list is incomplete or confusing (see discussion on Noise below). A professional organization should realize that appendixes should

stand on their own as they are often separated from the body of the original document. This is poor documentation and unacceptable for transparency to the public to which the BLM claims to aspire.

Adaptive management: adaptive management is totally dependent on the adequate collection and evaluation of data on the effectiveness of agency actions and restoration projects before any changes can be made. The draft EIS fails to disclose what data has been collected on agency efforts to implement GRSG conservation measures in the 2015 plan and subsequent LUP amendments and to evaluate their effectiveness. It appears that the BLM has no idea whether its current GRSG conservation actions are effective, or are failing, or how they need to be changed. Therefore, the draft EIS has no scientific data-based rationale for any amendments to the 2015 plan. In conclusion, I must agree with the 21 GRSG experts in a 6/8/18 letter to Secretary Zinke that the proposed LUP amendments would weaken current sage-grouse conservation measures before those measures have been fully implemented and tested for effectiveness. The best action that BLM could take is to abandon amending the GRSG conservation plans and Land Use Plans or to select the No Action Alternative to end this wasteful process. Instead, I'd strongly urge the BLM to put its resources into fully implementing the 2015 plans, adequately monitoring agency management and restoration projects for effectiveness and basing future adaptive management on at least five years of data which clearly shows what GRSG habitat management and restoration actions are successful in meeting agency goals and objectives and which are failures and need to be changed.

BLM's adaptive management procedures should focus more on pre-fire measures that reduce wildfire risks. The adaptive management provisions in Appendix D of the 2018 DEIS are not proactive because they focus on problems that have already happened (e.g., population declines and habitat loss) but they do not minimize risks due to wildfire which cause devastating habitat loss. WMC disagrees with BLM's position that "Adaptive management, with specific triggers (signals), provide additional certainty that the regulatory mechanisms included in the LUPA are robust and able to respond to a variety of conditions and circumstances quickly and effectively to conserve Greater Sage-Grouse habitat and populations." (DEIS at D-1).

The adaptive management measures need to be revised to provide BLM with the necessary flexibility and nimbleness to implement site-specific measures to reduce identified wildfire risks. If this means that some fuel reduction is warranted in GSG habitat areas in order to reduce wildfire risks, BLM should be authorized to implement appropriate measures to minimize the buildup of flammable fuels.

Several of the provisions in the adaptive management protocols in Appendix D cannot be applied to mineral projects because they are not consistent with claimants' rights pursuant to FLPMA and the U.S. Mining Law. Appendix D needs to be updated to clarify that the following adaptive management triggers (2018 RMP DEIS in D-6) do not apply to mining projects: 1. Delaying issuance of new permits and authorizations; 2. Delaying issuance of new or pending ROWs outside of designated existing corridors; 3. Increasing enforcement efforts on travel restrictions; 4. Limiting noise and/or light pollution; 5. Temporary closures; and 6. Eliminating allocation exception decisions in areas that have tripped a hard trigger.

Adaptive Management We appreciate the effort of the BLM to be more consistent with DOI Guidance on Adaptive Management, and also the inclusion of "local partners" throughout the process. Add a bullet to read "To the extent practical, utilize collaborative and consensus-based processes with stakeholders,

appropriate state and local agencies, and authorized land uses when developing and implementing management responses to any trigger met or surpassed."

2-8 and 2- 9 Table 2-2, Issue 3, Adaptive Management No-Action Alternative: The Adaptive Management Framework described in No-Action Alternative and contained in Appendix J of the current LUPA is NOT Adaptive Management as described by the DOIs own guidance document, see Figure 1.1 below from DOI 2009. This is particularly true of the Hard Trigger response that automatically implements a host of allocation decisions that may or may not be warranted based on the cause of reaching a hard trigger. Once the hard trigger responses are implemented there is no iterative implementation or path for reversing those automatic implementations. The scale of the response is also not well defined. Particular aspects of the Adaptive Management Approach not included that are currently under No-Action Alternative, and as described in DOI 2009 include: ? Assessment of Problem (particularly on Hard Trigger Response as there is no casual factor analysis); ? Design (particularly on Hard Trigger Response as responses are "hard wired" in at the RMP level); Page 24 of 89 ? Monitor; ? Evaluate; and, ? Adjust As such, the BLM should reject No-Action Alternative, and ensure that all Adaptive Management Process components listed in Figure 1.1 above are incorporated into Management Alignment Alternative, and Appendix D of this document. Management Alignment Alternative: We support BLM's adoption of the State's Adaptive Management Plan as approved by the Sagebrush Ecosystem Council at its July 17, 2018 meeting and working with us to further refine this process to be true Adaptive Management.

"Development of Allotment Management Plans (AMPs), as an objective, will include completion of technically sound inventories; ecological status inventory (ESI) is a minimum, with other techniques as appropriate such as use pattern mapping as a measure of animal distribution, actual use records, detailed weather records, stream channel morphology, woodland features including age structure and density of trees, and other studies using standardized techniques. So-called "rapid assessment" techniques are permitted and in fact encouraged in Eureka County as a way to identify specific technical studies that are needed. Rapid assessment includes such techniques as the DOI Rangeland Health approach and the Riparian Functional Condition" (p.6-8). o

The DEIS does not propose the implementation of any of these techniques through allotment specific AMPs. While there is discussion about implementation of AMPs in the DEIS, the ability to manage according to specific AMPs is undermined by the proposal of blanket restrictions, requirements, and actions across the entire landscape. There must be a focus on individual allotments through properly developed AMPs and associated resource inventories.

BLM must clarify which partners will be engaged in the Adaptive Management Habitat Analysis and to what extent those partners will be engaged Throughout Appendix D (outlining the Adaptive Management Plan), the RMPA/DEIS references "coordination with appropriate federal, state, and local partners (including local area conservation groups)," but Appendix D fails to clarify which entities will be considered for such partnership. At a minimum, these partnerships should include impacted land users such as ranchers as well as local extension agents from the University of California Cooperative Extension and University of Nevada Cooperative Extension. While these groups may already be considered for inclusion as "local partners (including local area conservation groups)," this should be clarified within the RMPA/DEIS to ensure that these stakeholders are not excluded from the incredibly-consequential Adaptive Management Planning process. Additionally, the RMPA/DEIS ought to clarify

whether the "appropriate federal, state, and local partners (including local area conservation groups)" detailed in Step 1 of the Trigger Responses and Causal Factor Analysis ("Assessment of Greater Sage-Grouse Population and Habitat Baseline Conditions") are the same as the "appropriate federal, state, and local partners (including local area conservation groups)" detailed in Steps 2 and 3 of the process.1 All steps of the Trigger Responses and Causal Factor Analysis ought to be conducted in cooperation with the same or similar partners to ensure consistency throughout the analysis and to ensure that experts and impacted producers are represented throughout the process. Finally, the RMPA/DEIS should be amended to ensure that those same "appropriate federal, state, and local partners (including local area conservation groups)" are consulted in determining whether reversal of trigger responses is appropriate under Section D.7 of the Adaptive Management Plan.

Greater attention needs to be given to the area of implementing adaptive management which considers the risk of fuel load levels. Proactive on-the-ground management should be applied to reduce the levels of massive wildfire destruction. Per Table 3-4 in the plan amendment, over 109,000 acres of greater sage-grouse habitat burned between 2015-2017. Livestock grazing should be viewed as an effective tool to improve range conditions or manage for fire as scientific support is growing for the value of properly-managed grazing related to pre- and post-fire management.

C.4.7 Mitigation

Mitigation As shown in Table 2-2 (DEIS at 2-10), the net conservation gain mitigation standard, which requires compensatory mitigation, is included in both the No Action and the Management Alignment Alternative/Preferred Alternative in the DEIS. In conjunction with the Management Alignment Alternative/Preferred Alternative, BLM is specifically seeking public comment on "whether the implementation of a compensatory mitigation standard on public lands is appropriate and consistent with applicable legal authorities" (DEIS at 2-17). PGC finds that compensatory mitigation on public lands is not consistent with FLPMA, which does not authorize compensatory mitigation. In fact, FLPMA is silent on the issue of mitigation. The statute does not include the word "mitigate" and mentions "mitigation" only once in FLPMA Section 603 pertaining to Wilderness Study Areas specifically in the context of the management directives for the Fossil Forest Research Natural Area.

Much of the surface disturbance associated with a mining operation can be effectively reclaimed to provide future habitat. Surface disturbance at exploration projects can typically be fully reclaimed. On-site reclamation of mining-related disturbances is a form of required mitigation. However, it is not compensatory mitigation as contemplated in the 2018 DEIS. If BLM concludes there are specific circumstances in which compensatory mitigation is authorized for certain public land uses, the FEIS should clarify that compensatory mitigation does not apply under any circumstances to activities conducted pursuant to the U.S. Mining Law and authorized under the 43 CFR Subpart 3809 regulations. Although PGC appreciates BLM's efforts to align the amended GSG LUP with the State of Nevada's 2014 GSG Conservation Plan, the State's net benefit (net conservation gain) standard and compensatory mitigation requirement are elements of the State's Plan that cannot be applied to projects on public lands. The Management Alignment/Preferred Alternative in the 2018 DEIS includes the State's net conservation gain/compensatory mitigation requirement. Because FLPMA does not authorize compensatory mitigation, the Preferred Alternative in the 2018 FEIS and the 2018 amended LUP must clarify that BLM does not have the authority to require compensatory mitigation on public lands. Additionally, Appendix F of the 2018 DEIS, "Nevada and Northeastern California Mitigation Strategy" requires substantial modification to eliminate the references to compensatory mitigation. It must also

explicitly state that compensatory mitigation does not apply to mineral activities on public lands. Appropriate mitigation measures for public land uses other than mining should be determined on a project-by-project basis based on site-specific factors, must be consistent with FLPMA's multiple use land use policies, and must not involve unauthorized compensatory mitigation. PGC believes that acquiescing to the State of Nevada and incorporating the Nevada net conservation gain/compensatory mitigation policies violates federalism principles. While the states may manage sage grouse, the states have no legal authority to dictate how federal lands are to be managed or to impose conditions like compensatory mitigation on federal land users. FLPMA does not authorize BLM to accept or substitute state standards that are inconsistent with federal policies such as landscape-scale land management and net conservation gain. BLM's mitigation authority is strictly and explicitly limited to the FLMPA mandate to prevent onsite UI-JD at projects on BLM-administered lands. It has absolutely no authority to require or sanction offsite compensatory mitigation for necessary and due impacts associated with authorized uses of public lands.

However, PGC remains concerned about the aspects of the Management Alignment Alternative that are based on the landscape-scale management and mitigation principles embraced in the following documents: The National Technical Team ("NTT") Report; The Conservation Objectives Team ("COT") Report; The October 2014 SFA Memo from the U. S. Fish and Wildlife ("FWS") Director to the BLM Director and the U.S. Forest Service Chief; The September 2014 U.S. FWS Mitigation Framework; The November 2014 USGS Lek Buffer Study; and The September 2015 Crist et al USGS Open File Report. Because all of these documents were developed to implement the Obama Administration's landscape-scale land use and mitigation policies, they are no longer consistent with current policy and the law as Congress clarified in its rejection of BLM's Planning 2.0 Rule. Consequently, BLM must eliminate any future reliance on the findings or recommendations in these documents. This is another compelling reason why the No Action Alternative, which uses these documents as a foundation, is not selectable. However, it also means that elements of the Management Alignment Alternative in the 2018 DEIS that are based on the above-listed documents must be eliminated from BLM's Preferred Alternative in the 2018 FEIS and the amended LUP. Specifically, the one-size-fits-all, landscape-scale land use restrictions based on the NTT Report such as uniform lek buffers, seasonal restrictions, noise restrictions, disturbance caps, and required design features need to be eliminated and replaced with project-specific conditions based on actual site habitat conditions. Additionally, as discussed in detail in Section IX, these land use restrictions cannot substantially interfere with a mining claimants' rights pursuant to the U.S. Mining Law (20 USC 21 a et seq as amended) and FLPMA Section 302(b) to explore and develop its mining claims or to enter and occupy public lands for mining purposes. As discussed in Section V, FLPMA does not authorize compensatory mitigation for unavoidable impacts to GSG. Thus, BLM's Preferred Alternative in the 2018 FEIS cannot include compensatory mitigation on public lands in the Nevada LUP despite the compensatory mitigation provisions in the State of Nevada's 2014 State GSG Conservation Plan. Although PGC appreciates BLM's efforts to work closely with the State of Nevada to align the amended LUP with the Nevada State Plan, this is one aspect of the Nevada State GSG Conservation Plan that must not be incorporated into BLM's 2018 GSG LUP amendments.

PGC finds that compensatory mitigation on public lands is not consistent with FLPMA, which does not authorize compensatory mitigation. In fact, FLPMA is silent on the issue of mitigation. The statute does not include the word "mitigate" and mentions "mitigation" only once in FLPMA Section 603 pertaining to Wilderness Study Areas specifically in the context of the management directives for the Fossil Forest Research Natural Area. FLPMA Section 302 (43 U.S.C § 1732(b)) establishes the environmental

protection standard that public land uses must prevent unnecessary or undue degradation ("I-JUD"). It does not require or authorize compensation or offsite mitigation for unavoidable onsite impacts (e.g., necessary and due impacts) associated with the use of public lands. In the case of mineral activities conducted pursuant to the Mining Law, FLPMA specifically prohibits impairment of a claimant's rights under the Mining Law of 1872: "Except as provided in section 314, section 603, and subsection (f) of section 601 of this Act and in the last sentence of this paragraph, no provision of this section or any other section of this Act shall in any way amend the Mining Law of 1872 or impair the rights of any locators or claims under that Act, including, but not limited to, rights of ingress and egress. In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. § 1732(b) 3 The statement: "The mitigation standard (net conservation gain) would be retained in the Management Alignment Alternative (and the No-Action Alternative) is repeated throughout Chapter 4 of the DEIS. Pursuant to this FLPMA directive and the U.S. Mining Law, BLM's discretionary authority is limited to preventing I-JUD, making the WD standard the only mitigation standard consistent with claimants' rights under the U.S. Mining Law as amended by FLPMA. BLM does not have the authority to require mineral project proponents to provide mitigation, including compensatory and/or offsite mitigation that exceeds the UI-JD standard. UI-JD must be determined on a project-specific basis to determine which impacts are avoidable (i.e., unnecessary and undue) and which impacts are unavoidable (i.e., necessary and due) in order to develop the mineral project. Consequently, there is no one-size-fits-all mitigation standard or uniform ratio that is applicable to mineral projects. The requirement to provide compensatory mitigation impairs a claimant's Mining Law rights to access, use, and occupy public lands for mineral purposes. BLM's 43 CFR Subpart 3809 surface management regulations for locatable minerals. In the preamble to the November 2000 revision to these regulations (65 Fed. Reg. 70012, November 21, 2000), BLM clearly stated that it has no authority to require offsite or compensatory mitigation, although BLM may accept compensatory mitigation if a project proponent voluntarily offers same. Moreover, nothing in FLPMA, any other federal statute, or the regulations, allow BLM to implement the net conservation gain standard. 43 CFR §§ 3809.414, .420, and .421 implement FLPMA's I-JUD environmental protection standard. In the context of GSG habitat, BLM may require a mining claimant to avoid and minimize impacts to GSG habitat so long as avoiding and minimizing impacts does not materially interfere with or compromise the claimant's rights under the Mining Law. If habitat is co-located with mineralization, it is not possible to avoid impacting the habitat in order to pursue mineral exploration and development activities. In this case, the impact to habitat is necessary and due and does not require mitigation. The reclamation requirements in the 43 CFR Subpart 3809 regulations provide for mitigation of impacts to GSG habitat wherever possible. Specifically, the definition of reclamation at 43 CFR § 3809.5 includes "rehabilitation of wildlife habitat." In order to comply with this definition, 43 CFR § 3809.401 (b)(3)(v) requires mineral operators to prepare reclamation plans that include a plan for wildlife habitat rehabilitation. Operators must also provide detailed baseline information about wildlife habitat (43 CFR § 3809.401 (c)) within their project boundary that BLM uses to prepare the NEPA analysis and to determine an appropriate post-mining wildlife rehabilitation plan. Much of the surface disturbance associated with a mining operation can be effectively reclaimed to provide future habitat. Surface disturbance at exploration projects can typically be fully reclaimed. On-site reclamation of mining-related disturbances is a form of required mitigation. However, it is not compensatory mitigation as contemplated in the 2018 DEIS. If BLM concludes there are specific circumstances in which compensatory mitigation is authorized for certain public land uses, the FEIS should clarify that compensatory mitigation does not apply under any circumstances to activities conducted pursuant to the U.S. Mining Law and authorized under the 43 CFR Subpart 3809 regulations. Although PGC appreciates BLM's efforts to align the amended GSG LUP with the State of Nevada's

2014 GSG Conservation Plan, the State's net benefit (net conservation gain) standard and compensatory mitigation requirement are elements of the State's Plan that cannot be applied to projects on public lands. The Management Alignment/Preferred Alternative in the 2018 DEIS includes the State's net conservation gain/compensatory mitigation requirement. Because FLPMA does not authorize compensatory mitigation, the Preferred Alternative in the 2018 FEIS and the 2018 amended LUP must clarify that BLM does not have the authority to require compensatory mitigation on public lands. Additionally, Appendix F of the 2018 DEIS, "Nevada and Northeastern California Mitigation Strategy" requires substantial modification to eliminate the references to compensatory mitigation. It must also explicitly state that compensatory mitigation does not apply to mineral activities on public lands. Appropriate mitigation measures for public land uses other than mining should be determined on a project-by-project basis based on site-specific factors, must be consistent with FLPMA's multiple use land use policies, and must not involve unauthorized compensatory mitigation. PGC believes that acquiescing to the State of Nevada and incorporating the Nevada net conservation gain/compensatory mitigation policies violates federalism principles. While the states may manage sage grouse, the states have no legal authority to dictate how federal lands are to be managed or to impose conditions like compensatory mitigation on federal land users. FLPMA does not authorize BLM to accept or substitute state standards that are inconsistent with federal policies such as landscape-scale land management and net conservation gain. BLM's mitigation authority is strictly and explicitly limited to the FLMPA mandate to prevent onsite UI-JD at projects on BLM-administered lands. It has absolutely no authority to require or sanction offsite compensatory mitigation for necessary and due impacts associated with authorized uses of public lands.

Based on BLM 1M 2018-039, we now need additional direction and information from the BLM on compensatory mitigation for projects that might adversely impact greater sage-grouse in Nevada.

We request clarification as to how BLM will be able to endorse and encourage the use of the CCS for compensatory mitigation, if it is no longer required by BLM. Additionally, current language in the DEIS commits BLM to quantifying impacts of anthropogenic disturbances utilizing the CCS Habitat Quantification Tool (HQT). Will the use of the HQT for quantifying disturbance impacts and voluntary mitigation still be supported by BLM?

The DEIS requests input on mitigation and we believe this certainly warrants clarification as to how the IM relates to the proposed amendments in the DEIS, but also should be analyzed through supplemental NEPA.

The County requests that the BLM be clear in terms of when it can require mitigation (as well as what mitigation standards it can implement) and when it can't require mitigation. The County supports some standard means for quantifying both impacts and mitigations in Sage-grouse habitat.

Once the quantification method is clear and set, the BLM should indicate how impacts and mitigations will be "balanced" (i.e. no loss of 'functional acres' as determined through application of the HQT), at least for those allocation decisions where the BLM can require mitigation, The County understands that the BLM cannot require use of the State of Nevada's Conservation Credit System (CCS), which is unfortunate as it appears to be the only consistent means of determining appropriate mitigation.

Nevada requires mitigation in Priority Habitat Management (PHMA), General Habitat Management Areas (GHMA) and Other Habitat Management Areas (OHMA), which is different than BLM

requirements. The NvMA suggests the BLM modify Appendix F to refer to Greater Sage Grouse (GRSG) habitat to include all three habitat types to better align with Nevada's Conservation Plan.

The NvMA supports continued implementation of specific mitigation banking agreements, such as those entered into between BLM and Barrick and Newmont and believes that the land use plan amendment should explicitly acknowledge those existing agreements.

The NvMA supports BLM use of Nevada's Habitat Quantification Tool (HQT) to identify impacts to greater sage grouse and their habitat and encourages the agency to identify Nevada's Conservation Credit System (CCS) as the methodology of choice in the development of mitigation options, except where BLM has entered into a separate agreement to account for sage grouse impacts and mitigation, such as the current programs being implemented by Barrick and Newmont.

Under Appendix F, the NvMA is greatly concerned about mitigation actions conducted on public lands and the ability of the federal land managers to protect those lands from anthropogenic disturbances (i.e. roads, power lines, etc.). The BLM must develop a process of easements, rights-of-way or other land use restrictions to ensure the long-term durability of mitigation projects.

Under Appendix F, provisions should be made to ensure coordination with the State of Nevada on federal mitigation activities conducted outside of the CCS. It is critical that all parties be aware of ongoing mitigation activities at both the federal and state levels.

For consistency, in Appendix F the HQT should be referenced and used in all mitigation projects unless those proj ects are covered by a separate mitigation or banking agreement.

Restore degraded sage-grouse habitat. Sage-grouse have already lost nearly half their range to agriculture and development. If there is to be any hope for the different state and federal plans to work together, this loss of habitat must cease. The federal sage-grouse conservation strategy should be updated to support active restoration of areas that can still be used by sage-grouse and other wildlife.

Mitigation No-Action Alternative: The No Action Alternative remains ambiguous in its definition and application of "Net Conservation Gain" and has no consistent way of quantifying impacts and applying mitigation. As such, the County opposes the No-Action Alternative. Management Alignment Alternative: The BLM must clarify, for consistency sake, if it is implementing an "avoid, minimize and compensate" or "avoid, minimize and mitigate", and better define what it means in terms of the difference between "compensate" and "mitigate" and how these would be applied. The State is very clear in terms of requiring mitigation of all anthropogenic disturbance as determined through the CCS. Since the BLM has stated it cannot require mitigation in all circumstances, and that it cannot require use of the CCS, then the BLM needs to be clearer in terms of how it is "aligning" with the State Plan. The County supports utilizing the State's Habitat Quantification Tool (HQT) as a consistent means of tracking changes to habitat quantity and quality. The BLM references the State's "net conservation gain" standard, but to fully align with the State, the BLM must also adopt the State's definition where "Net conservation gain is defined as the State's objective to maintain the current quantity and quality of sage-grouse habitat within the Service Area at the statewide level by protecting existing sage-grouse habitat or by mitigating for loss due to anthropogenic disturbances. Mitigation requirements are determined by the Conservation Credit System. This objective will be measured by the credit to debit ratio." Currently, it is unclear as to whether the BLM is proposing to adopt this definition and apply this standard. We request that the BLM

clarify this. The statement, from Table 2-2, page 2-10 of the Management Alignment Alternative, that "...mitigation would be considered subject to the federal regulations governing the authorization..." is very ambiguous, whereas the State is very clear in their Plan that "Mitigation will be required for all anthropogenic disturbances impacting sage-grouse habitat within the Service Area." Clarification needs to be provided in terms of how the BLM plans to align with the State Plan in circumstances where ...federal regulations governing the authorization..." do NOT allow for or mandate 'mitigation' following avoidance and minimization, and such authorizations should be clearly disclosed. For consistency sake, NACO supports the use of the State's HQT and/or CCS to determine mitigation that meets the State's objective, stated in the State Plan, to " ...maintain the current quantity and quality of sage-grouse habitat..." when it is determined that additional mitigation, in addition to avoidance and minimization actions, would be required in order to actually "maintain the current quantity and quality of GRSG habitat".

Net conservation gain principle, tied to compensatory mitigation, is a bedrock principle of our SGMP that must not be altered. The preferred alternative description states it shall remain as objective of compensatory mitigation, yet in the same paragraph, red flags are raised that there was inadequate public comment opportunity on the concept and that compensatory mitigation itself may not be appropriate or legal.

There must not be exemptions to mitigation. Please clarify with more specifics and definitions as to what are "exemptions criteria".

Language must be added acknowledging BLM's already existing authority to require mitigation in case specific circumstances. Please recognize the requirement in the state plan: "Mitigation will be required for all anthropogenic disturbances (that cannot be avoided) impacting SG habitat within the SGMA."

BLM should align with the NV Plan language to a.) "Avoid, Minimize, Mitigate", rather than the proposed "Avoid, Minimize and Compensate". b.) Require mitigation in all 3 habitat types (PHMA, GHMA & OHMA -- O: other), as expressed in the NV plan, rather than just the first

Also the Federal Register Notice of July 30, 2018 regarding the U.S. Fish and Wildlife Services withdrawal of Mitigation Policy and Compensatory Mitigation Policy needs clarification for the "Mitigation" section of the Preferred Alternative.

The RMPA should expressly recognize the BEA as an approved methodology for quantifying impacts and voluntary compensatory mitigation. As noted above, following the Nevada Governor's Consistency review, BLM added language to the LUPA expressly acknowledging that actions taken under the BEA were consistent with the LUPA. That language is included in the discussion of mitigation in the Table 2-2 (Comparison of Alternatives) in the Draft RMPA/EIS on page 2-11. The current plan states that BLM will "authorize locatable mineral development activity, by approving plans of operation and apply mitigation and best management practices that minimize the loss of PHMAs and GHMAs or that enhance Greater Sage-Grouse habitat by applying the 'avoid, minimize and compensatory mitigation' process through an applicable mitigation system, such as the Nevada Conservation Credit System and the Barrick Nevada Sage-Grouse Bank Enabling Agreement (March 2015)." Draft RMPA/EIS at p. 2-11 (emphasis added). In the description of the Management Alignment Alternative in the same table, the Draft RMPA/EIS discusses coordination with the Nevada SETT and the Nevada Conservation Credit System but does not explicitly reference the BEA. Barrick requests that language from the LUPA referring to the BEA be

retained in the ARMPA or that new language be added, similar to the language in the current LUPA, to acknowledge that, where applicable, BLM will rely on the BEA to calculate impacts and compensatory mitigation. Specifically, BLM should add the following language to the end of that section: Within the area covered by the Barrick Nevada Sage-Grouse Bank Enabling Agreement (March 2015), BLM will calculate impacts and evaluate voluntary proponent-developed mitigation options in accordance with that Agreement.

Defer to Nevada's Sage Grouse Conservation Plan The purpose of the Management Alignment Alternative, as described in the DEIS, is to "better align BLM management direction with the State of Nevada's Conservation Plan and conservation strategies . . ." DEIS at page 2-3. LNC supports this objective and the changes proposed to the RMP (and listed on DEIS page 2-3) to move the BLM plan closer to the Nevada plan. However, more changes may be necessary to align the BLM's plan with the Nevada plan. In LNC's view, deferring to the Nevada plan means that BLM would eliminate required design features, lek buffer zones, disturbance caps and other management restrictions in the current LUPA from project-level approval decisions. These measures could still be considered by project proponents and implemented, where appropriate to minimize impacts, but would not be mandatory. Based on site-specific conditions, implementing design features or other avoidance or mitigation measures would reduce compensatory mitigation obligations, but could not be used as a basis for denying project approval. While the draft plan retains the "net conservation gain" requirement, we expect that the final plan will remove that standard based on the July 24, 2018 BLM Instruction Memorandum regarding Compensatory Mitigation. LNC continues to support voluntary compensatory mitigation and believes that the revised resource management plan should acknowledge and encourage, but not require, such mitigation for impacts to greater sage-grouse habitat.

BLM has ample authority to use the entire mitigation hierarchy, including by imposing compensatory mitigation. As a preliminary matter, BLM should not implement IM 2018-093, because it incorrectly interprets NEPA, FLPMA, and various other federal laws and rules, and departs dramatically from long-standing agency practice.

To protect the present and long-term use of the public land for "fish and wildlife" "without impairment of the quality of the environment," BLM has the authority to apply the mitigation hierarchy for sage grouse, including compensatory mitigation in appropriate circumstances. Thus, BLM has additional, clear authority to use the mitigation hierarchy in its land use plans for the protection of the sage-grouse and its habitat. Case law confirms that multiple use/sustained yield principles do "not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required." New Mexico ex rel. Richardson v. BLM, 565 F.3d 683, 710 (10th Cir. 2009). The mitigation hierarchy, including compensatory mitigation, provides an important tool for achieving a balance among the multiple uses allowed on public lands. BLM can authorize a consumptive use, like oil and gas development, but balance that use by providing compensatory mitigation for the unavoidable losses suffered by the fish and wildlife. In other words, the mitigation hierarchy can have the effect of expediting and defending authorized consumptive uses of the public lands while simultaneously protecting fish and wildlife resource values in perpetuity. Beside the principles of FLPMA and its multiple use/sustained yield standards, individual provisions of that Act confer additional authority on BLM to apply the mitigation hierarchy. In the section on land use plans, for example, FLPMA obliges BLM to consider environmental values, such as fish and wildlife like the sage grouse, in the development of such plans.19 More particularly, BLM must also "consider the relative scarcity of the values involved and the availability of

alternative means…and sites for realization of those values".20 Sage-grouse habitat is a wildlife value with relative scarcity, as evidenced by the Fish and Wildlife Service's consideration of the species for listing under the Endangered Species Act, its designation as a special status species by BLM, and its active management by numerous Western states. In the process of developing land use plans which account for this important and relatively scarce species, BLM can provide for the use of "alternative sites" in appropriate instances, thereby resulting in avoidance. Similarly, BLM can specify "alternative means," which can include minimization as well as compensatory mitigation under appropriate circumstances. In short, resources designated as "special" by BLM should be managed through a resource goal that may necessitate compensatory mitigation actions, as appropriate.

Both FLPMA and the case law thus establish that BLM has ample discretion to go beyond the prevention of unnecessary or undue degradation to seek compensatory mitigation that will meet "the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, . . . wildlife and . . . natural scenic, scientific and historical values."27 None of these authorities distinguish between avoidance, minimization, and compensatory mitigation or prohibit or circumscribe compensatory mitigation; rather, the authorities are broad and support the use of each aspect of mitigation in appropriate circumstances.

BLM must prepare a supplemental EIS to evaluate the impacts of Instruction Memorandum (IM) 2018-093, which prohibits BLM from adopting the "net conservation standard" and requiring compensatory mitigation. Supplemental EISs are required for "substantial changes in the proposed action that are relevant to environmental concerns" or "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1)(i), (ii). Because IM 2018-093 is a paradigm shift on mitigation and eliminates one of the pillars upon which the 2015 ARMPAs and "not warranted" determination stand, BLM must now prepare a supplemental EIS. Turning to the NV/CA Draft EIS, IM 2018-093 requires "substantial changes" to the proposed action that must be thoroughly evaluated in a supplemental EIS. BLM included the "net conservation gain" standard in the Management Alignment Alternative at the behest of the states of California and Nevada: "With respect to compensatory mitigation in particular, at the request of the States, the Management Alignment Alternative in this Draft RMPA/EIS includes the net conservation gain standard for compensatory mitigation that the BLM incorporated into its plans in 2015." NV/CA Draft EIS at 2-17. Accordingly, BLM predicated specific proposed actions on compliance with the "net conservation gain" standard, including: * Exceptions to Fluid Minerals Stipulations - permitted if impacts "could be offset through use of the mitigation hierarchy (avoid, minimize, mitigate) to achieve a net conservation gain. . .", id. at E-4; * Nevada and NE California Mitigation Strategy - predicated on the use of compensatory mitigation when impacts "remain . . . or cannot be rectified through reclamation. . .", id. at F-1; and 26 Western Exploration, LLC v. U.S. Department of the Interior, at 34 (citations omitted). 27 43 U.S.C. § 1702(c). * Exceptions for Land Disposal - permitted if the proposal "can achieve a net conservation gain through the use of compensatory mitigation." Id. at 2-13. Because IM 2018-093 prohibits BLM from "imposing" compensatory mitigation through "environmental impact statements" and "resource management plans," BLM is arguably obligated to delete these proposed actions from the EIS. These changes are neither "minor" nor "qualitatively within the spectrum of alternatives" evaluated in the Draft EIS. See Council on Environmental Quality, 40 Most Questions Asked Questions Concerning CEQ's NEPA Regulations at 22, available at https://www.energy.gov/sites/prod/files/G-CEQ-40Questions.pdf. They go to the very heart of the conservation strategy set forth in the ARMPAs and ratified by the "not warranted" determination. See, e.g., 80 Fed. Reg. at 59,881 ("Requiring mitigation for residual impacts

provides additional certainty that, while impacts will continue at reduced levels on Federal lands, those impacts will be offset to a net conservation gain standard."). Additionally, IM 2018-093 represents the very sort of "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" that demand further analysis. This is because the Draft EIS incorporates the "net conservation gain" standard throughout the Management Alignment Alternative, and the only other alternative evaluated - the no action - would retain the current version of the NV/CA ARMPA, which also contains the standard. Thus, the Draft EIS neither envisions nor evaluates eliminating entirely the "net conservation gain" standard and compensatory mitigation. Further, to the extent that BLM could rely on the range of alternatives originally evaluated for the ARMPA (which it cannot, as discussed above), those alternatives are of no help. None of those alternatives disclaimed the authority to impose "compensatory mitigation" as a means of offsetting unavoidable impacts on sage-grouse. In fact, each of the action alternatives incorporated the Regional Mitigation Strategy, NV/CA ARMPA at 2-92, carved out a robust role for compensatory mitigation: "If impacts from BLM/Forest Service management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species[.]" Id. at App. I-1. And the no-action alternative does not save BLM from needing to complete a supplemental EIS, because the RMPs preceding the ARMPAs also authorized the use of compensatory mitigation. See, e.g., BLM, Winnemucca RMP 2-107 (May 2015) ("Mitigation may be achieved avoidance, minimization, rectification, reduction, and compensation.");28 BLM, Ely District ROD and ARMP A.2-5 (Aug. 2008) ("The plan of development must demonstrate no significant impact will occur through mitigation of impacts, compensation (in accordance with BLM policy), and restoration of the land to pre-disturbance condition.");29 BLM, Tonopah RMP and ROD 8 (Oct. 1997) ("Off-site mitigation may be negotiated during a plan operations review for locatable mineral actions when an irretrievable loss of critical or crucial habitat is unavoidable, or a significant long-term adverse impact will occur.").30 In conclusion, IM 2018-093 requires "substantial changes" to the Draft EIS's Management Alignment Alternative that are not evaluated in the Draft EIS, the 2015 ARMPAs, or the RMPs preceding the ARMPAs. Accordingly, BLM must now prepare a supplemental EIS to evaluate the elimination of the "net conservation gain" standard and the new prohibition on compensatory mitigation.

BLM has the authority to incorporate, implement, and enforce state sage-grouse mitigation programs that meet a recognized set of principles. Governor Sandoval requested that BLM "[a]dopt the mitigation policy in the Nevada Plan and the [Conservation Credit System] as the preferred approach to incentivize avoidance, minimization, through the use of required design features and require mitigation for residual direct and indirect impacts that cannot be avoided." Letter from Gov. Brian Sandoval, to Secretary Ryan Zinke 2 (Nov. 30, 2017). Accordingly, the NV/CA Draft EIS proposes to "apply the mitigation hierarchy . . . in the State of Nevada's Greater Sage-Grouse Conservation Plan" and retain the "net benefit (net conservation gain)" standard adopted by the State of Nevada. NV/CA DEIS at 2-10. The recent issuance of IM 2018-093 calls this commitment into question.

Given BLM's broad authority to adopt and impose mitigation to protect sage-grouse, at a minimum, BLM certainly can act to adopt, implement and enforce the state mitigation programs for use on federal land. In doing so, it is critical to ensure that the state mitigation programs employed by BLM follow commonly recognized principles, such as those laid out by The Nature Conservancy in its 2015 report, Achieving Conservation and Development: Applying the Mitigation Hierarchy (2015 TNC Report).35 These principles include: application of the mitigation hierarchy in a landscape context; policy goals that

support conservation and drive accountability; inclusion of stakeholder engagement practices; long-term, durable options; additionality, equivalence, and protection against temporal losses.36

Yet, it is not clear how BLM would be able to adopt and enforce state mitigation plans, such as the Nevada plan, as part of this sage-grouse management plan, which is essential for maintaining the "regulatory certainty" required by the 2015 "not warranted" determination. Therefore, in addition to completing the necessary supplemental NEPA to evaluate the impacts of the new guidance on the Nevada/Northeast California Plan, as discussed above, BLM must also clarify how the IM permits it to continue to uphold its commitment to the states in terms of applying state mitigation plans and will allow BLM to provide the necessary "regulatory certainty" to avoid the need for an ESA listing.

2-13 Table 2-2 Allocation Exception Compensatory mitigation should only be sought after all other options are exhausted as it relates to disposal lands or previous Congressional

Process, Section vi. authorizations. Those costs should be born by the managing agency as part of the disposal and mitigation process.

There is no lawful authority by the BLM to impose "net conservation gain" in an RMP, even if it is a desired environmental mitigation baseline by some constituencies to this BLM LUP review. FLPMA represents a "balance of two vital - but often competing - interests": the "'need for domestic sources of minerals, food, timber, and fiber from the public lands,'" and the protection of "'the quality of scientific, scenic, historical, ecological, environmental, air, and atmospheric, water resource, and archeological values.'" Mineral Policy Center v. Norton, 292 F. Supp. 2d 30, 33 (D.D.C. 2003) (quoting 43 U.S.C. §§ 1701(a)(12) and (a)(8)). FLPMA contemplates and accepts that authorized land uses can have impacts on Federal lands. The statute requires the Secretary to "take any action necessary to prevent unnecessary or undue degradation of the [public] lands," 43 U.S.C. § 1732(b), a provision referred to as the "UUD" standard. BLM's regulations define UUD, for mining purposes, as prohibiting "conditions, activities, or practices" that are "not reasonably incident to prospecting, mining, or processing operations." 43 C.F.R. § 3809.5 (quotation marks omitted). Even if desired, the UUD standard does authorize the BLM to limit the degradation of public land resources resulting from authorized uses. The agency may prohibit not only unnecessary impacts but also those impacts that, despite being necessary to an authorized land use, are undue or excessive. As directed by Congress, FLPMA accommodates reasonable public land development in order to fulfill the vision of the multiple use mission of Western public lands. Accordingly, flexibility within designated habitat management areas is accommodated through the UUD standard as a direct expression of Congress. GRSG conservation-range wide-can comfortably be implemented to compensate for reasonable land use within important GRSG habitat without confronting FLPMA's delicate balancing of land use and land stewardship.

In IM 2018-093, the BLM recently had cause to define the parameters of voluntary compensatory mitigation. According to IM 2018-093, compensatory mitigation as a condition of permitting is not authorized under any organic direction under FLPMA as a required condition to use public lands. However, compensatory mitigation that a project proponent proposes continues to be a tool, but, importantly, must be voluntary. According to the BLM, compensatory mitigation is "voluntary" when a project proponent's activities, payments, or in-kind contributions to conduct off site actions to minimize the impacts of a proposed action are free of coercion or duress, including the agency's withholding of authorization for otherwise lawful activity, or the suggestion that a favorable outcome is contingent upon adopting the compensatory mitigation program. Indicia of Page Nineteen voluntary compensatory

mitigation are that the BLM not explicitly or implicitly suggest that project approval is contingent upon proposing compensatory mitigation or that doing so would reverse or avoid an adverse finding. If voluntary, a project proponent may proffer such mitigation and the BLM may consider such voluntary compensation as a means to reach a finding of no significant impact ("FONSI") or as a part of a proposed designed feature of a project. See IM 2018-093. Commenters' members have engaged in voluntary ESA conservation activity, including candidate conservation agreement with assurances (CCAAs) on private surface and candidate conservation agreement (CCA, without assurances) on federal surface. The construct, operation, and funding of these agreements have been, and will continue to be, a fundamental part of the business model of companies whose activities may affect species with special status designations or their habitat. Accordingly, to the extent such voluntary conservation is reaffirmed and voluntarily implemented, they must be accounted for appropriately in these land use plan amendments as an asset to GRSG conservation.

Good mitigation policy and practice is one of the best opportunities to achieve sustainable development and conservation goals. Where impacts cannot be avoided or minimized, well-designed compensatory mitigation programs can achieve the multiple-use, sustained yield objectives.

Finally, we would like to note the Mitigation Strategy issue. The two alternatives for the strategy presented in the draft are similar, but there's one major different. The Mitigation Strategy in the Preferred Management Alignment Alternative aligns more with the State of Nevada's mitigation strategy. This means that when determining the impacts, the Bureau would use Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking and reporting to habitat quality and quantity. Also, mitigation options would be assessed using the HQT under this alternative. This is different from the No-Action Alternative that relied heavily on just Nevada's Conservation Credit System to gage compensatory mitigation. While the inclusion of the HQT is a step in the right direction in setting a better mitigation strategy, adding elements of the conservation alternative would create a more protective Mitigation Strategy and allow the Bureau and parties to properly respond to problems facing the Greater Sage-Grouse.

The DEIS includes references to both "avoid, minimize, mitigate" which WEX agrees is an appropriate consideration under the mitigation hierarchy (subject to rights under the Mining Law and VERs) and also to "avoid, minimize, compensate" which is unsupported by law and inconsistent with the national policy to eliminate compensatory mitigation (which also is unsupported by law and can constitute an interference with property rights and reasonable investment backed expectations). Accordingly, WEX respectfully requests that the final decision remove reference to "avoid, minimize, compensate."

We request public comment about how the BLM should consider and implement mitigation with respect to the Greater Sage-Grouse, including alternative approaches to requiring compensatory mitigation in BLM land use plans."

we request that in accordance with the office of the Solicitor's M-37046 memo, language be added in the EIS that acknowledges BLM's authority to require mitigation in case-specific circumstances, under already existing authorities, and depending on the type of authorizing action. The SETT also requests that the BLM recognize the requirement the State has regarding mitigation in the Sage Grouse Management area found in the Consolidated State Plan on page 18, "Mitigation will be required for all anthropogenic disturbances impacting sage-grouse habitat within the SGMA."

SEP requests language stating that when proponents express a desire to perform compensatory mitigation, the SETT will be notified and given ample opportunities to liaise with the BLM and the project proponents at the earliest stages of project development.

The processes developed in the bullets seem to fit in under the "avoid" and "minimize" processes and not as exemptions to mitigation. Request more clarifying language.

How will reinforcement of timely, durable, and additional mitigation be upheld; particularly the durability component on proponent-driven mitigation on public lands? The SETT recommends further development of the concept. Durability of habitat over the term of disturbance is a significant component of the CCS. Clarification on this concept will need to be developed when addressing proponent-driven mitigation.

The SETT recommends the establishment of protocols and responsibility for reporting on compensatory mitigation projects that occur outside the CCS.

The SETT requests additional language clarifying how the intent, method of analyzation, or who and how an "upward adjustment of the valuation" will be conducted.

Use of the HQT to quantify outcomes should be incorporated on all compensatory mitigation projects to enable a comparative analysis of net conservation gain

The SETT recommends addressing how net conservation gain will be accomplished or reported if projects with valid existing rights move forward with mitigation efforts that are not commensurate with direct, indirect, cumulative, and permanent impacts.

How would net conservation gain be demonstrated in proponent driven projects?

The SETT requests the following statement is inserted as a new bullet at the end of this list: "Although Federal agencies have yet to allow CCS credit projects to be sited and developed on public lands to serve as compensatory mitigation, the BLM will continue to work with the SETT to ensure fulfillment of this objective in the near future."

Mitigation: The County does NOT support the "No Action Alternative" for the following reasons. The County requests that the BLM address the "net conservation gain" standard, which is currently being implemented in some instances under the 2015 LUP, even though Secretary Zinke revoked the policy by rescinding Secretarial Order 3330. The County has found the net conservation gain standard to be a moving target and is consistent. While the 2015 LUP requires compensatory mitigation, the policy the LUP was based upon was unlawful and now has been repealed. The County supports the "Management Alignment Alternative" with several suggested clarifications. The BLM needs to better define "net conservation gain" and how this will be measured on a consistent basis. If this cannot be done, then the "net conservation gain" requirement should be removed all together. The BLM should also disclose what it can and cannot require in terms of mitigation for each allocation type and/or process (i.e. mineral exploration and development versus renewable energy development). If the BLM doesn't have the authority to require mitigation for certain land uses, then it must disclose that. Further, the BLM must disclose its authorities for requiring compensatory mitigation for given allocations and identify the most consistent means of accomplishing this. The County supports a mitigation standard that is both

consistent and clear regarding its application so that the industry has some level of regulatory certainty when considering projects located on public lands. If the State's Habitat Quantification Tool is the best means of consistently measuring impacts, then it should be implemented to the greatest practical extent. The County believes that any mitigation actions taken should prioritize and focus on control and reduction of excess fuels and invasive / noxious weeds as a means of reducing fire potential and severity.

1 1-8 Table 1-2, Row 5, Mitigation NCA supports bullet 1 NCA requests a revision of the second bullet so that it reads, "Provide consistency in application of mitigation, quantification and tracking of mitigation actions."

Regardless of the standard employed, it is most important that there be a high level of certainty that direct, indirect, and cumulative impacts of infrastructure development will be offset with high quality, durable, timely, and additional compensatory mitigation projects. High quality compensatory mitigation projects are guided by mitigation programs that appropriately account for the magnitude, extent and duration of impacts, characterize the benefits of compensatory mitigation projects, and ensure that compensatory mitigation projects are durable.

The fact that the state programs differ from each other is not necessarily a concern; in fact, variation can often result in good management outcomes, enabling programs to be tailored to the needs of each state, as well as allowing states to experiment and determine which approaches are most effective.

There are large variations in the quality of habitat for sage-grouse, and a significant likelihood of failure of restoration of habitat due to catastrophic fire events and the current low success rates of restoration.51 Recognizing these issues, most state sage-grouse mitigation programs, such as Nevada, address the variation in habitat quality by including measures of habitat functionality and using adjustment factors to account for the risk of failure and temporal loss. If habitat functionality is 48 McKinney and Wilkinson. Achieving Conservation and Development: Applying the Mitigation Hierarchy. (April 2015). https://www.nature.org/ourinitiatives/applying-the-mitigation-hierarchy.pdf 49 Id. 50 2016 Work Group Mitigation Report, p. 7. 51 See, e.g., Hanser, S.E., et al., 2018, Greater sage-grouse science (2015-17)-Synthesis and potential management implications: U.S. Geological Survey Open-File Report 2018-1017 at p. 23 ("Restoring sagebrush communities can be difficult, costly and slow… [Q]uestions remain concerning where treatments should be sited within a landscape to best achieve desired conditions in the long term as well as their effects on habitat selection and demography"). Detailed Comments on NV-CA DEIS The Nature Conservancy 14 of 23 considered, state agencies can use a ratio-based estimate, adjusted to include consideration of factors such as likelihood of success and temporal loss of functions. Compensatory mitigation programs need not rely upon overly complicated measures - they must be defensible but need not be overly precise.

BLM should review the legal basis, or lack thereof, for the net conservation gain standard adopted in the 2015 plans.

Because the net conservation gain mitigation policy was first formulated and imposed upon the regulated community by the previous Administration, the current BLM needs to uniformly establish compensatory mitigation standards across state lines and in compliance with federal law.

The anomalous nature of the net conservation gain standard is perhaps best illustrated in Appendix F to the DRMP/DEIS, Section F.5 Glossary, in which compensatory mitigation is defined as compensating for

residual impacts by replacing or providing substitute resources or environments whereas net conservation requires compensation that results in a net increase to the quantity and quality of the habitat. The latter concept is outside the plain meaning of the mitigation hierarchy as defined at 40 CFR § 1508 and thus lacks statutory or regulatory authority for imposition on the regulated community. The net conservation gain standard should be eliminated from the Nevada FEIS/RMP.

Maintain a strong "net conservation gain" standard. Sage-grouse habitat is Nevada is almost entirely found on federally-managed public lands, and in order to offset development and properly manage these lands, BLM must have a strong science-based plan that includes this standard so as to give the species a chance at long-term recovery.

Development on existing leases should be managed under current regulations, which limit surface occupancy and disturbance. Years of research leave no doubt that sage-grouse do not do well in close proximity to energy development.

Restore No Surface Occupancy stipulations as mandatory for sage-grouse habitat when leasing for energy development. Allowing exceptions, in light of what we know with the science, will result in poorly planned development that negatively impacts habitat and leads to fewer birds.

Improve plan monitoring and oversight, including providing training to field staff and the necessary incentives to ensure proper implementation. The plans should contain metrics by which conservation success can be measured. Conservation metrics will help in effective management of the habitat and reduce wasting personnel time and limited funds.

In light of the recent BLM IM No. 2018-093 on compensatory mitigation, additional information and direction will nobe required by BLM. Based on BLM IM 2018-039, we now need additional direction and information from the BLM on compensatory mitigation for projects that might adversely impact greater sage grouse in Nevada.

The removal of compensatory mitigation requirements from the RMPS DEIS has not been identified as a potential update to the rmpa through the cooperator and public NEPA process, only that alternatives to compensatory mitigation would be considered.

We request clarification as to how BLM will be able to endorse and encourage the use of the CCS for compensatory mitigation if it is no longer required by BLM.

Will the use of the HQT for quantifying disturbance impacts and voluntary mitigation still be supported by BLM?

We hope the BLM will better address wildfire, adaptive management and compensatory mitigation in the FEIS.

Therefore, throughout Appendix F, and throughout the whole of the RMPA, the phrase "net conservation gain" should be replaced with "no net loss of habitat."

MITIGATION The Instruction Memo IM2018-093 released July 24, 2018 seems to contradict mitigation planning provided in the EIS and specifically in Appendix F: Mitigation Strategy. We need clarification if

the IM specifically delegates mitigation to the state offices or if the strategy in Appendix F will be reissued. Mitigation is an important part of a proponent's planning to account for impacts and improve the environment as a result of a proposed project. Mitigation is not, and never has been, inexpensive. Uncertainty over mitigation adds time and cost and, therefore, makes some projects uneconomic. In general, uncertainty impacts our ability to attract investors because costs are not clear. Any policy that is unclear or that invites lawsuits (whether or not the court agrees with the plaintiff's argument) inserts more uncertainty. Uncertainty should be avoided. While Appendix F clearly defines relevant terms, there are no references to assist the public in understanding the scientific basis or for further research, especially into state programs mentioned in the text

Management Alignment Alternative: The first paragraph must clarify, for consistency sake, if the BLM is implementing an "avoid, minimize and compensate" or "avoid, minimize and mitigate", and better define what it means in terms of the difference between "compensate" and "mitigate" and how these would be applied. The State is very clear in terms of requiring mitigation of all anthropogenic disturbance as determined through the CCS. Since the BLM has stated it cannot require mitigation in all circumstances, and that it cannot require use of the CCS, then the BLM needs to be clearer in terms of how it is "aligning" with the State Plan. In paragraph 2, NACO supports utilizing the State's Habitat Quantification Tool (HQT) as a consistent means of tracking changes to habitat quantity and quality. The BLM references the State's "net conservation gain" standard, but to fully align with the State, the BLM must also adopt the State's definition where "Net conservation gain is defined as the State's objective to maintain the current quantity and quality of sage-grouse habitat within the Service Area at the statewide level by protecting existing sage-grouse habitat or by mitigating for loss due to anthropogenic disturbances. Mitigation requirements are determined by the Conservation Credit System. This objective will be measured by the credit to debit ratio." Currently, it is unclear as to whether the BLM is proposing to adopt this definition ad apply this standard. Please clarify. Paragraph 3 is very ambiguous in terms of the statement that "…mitigation would be considered subject to the federal regulations governing the authorization…" whereas the State is very clear in that "Mitigation will be required for all anthropogenic disturbances impacting sage-grouse habitat within the Service Area." Clarification needs to be provided in terms of how the BLM plans to align with the State Plan in circumstances where "…federal regulations governing the authorization…" do NOT allow for or mandate 'mitigation' following avoidance and minimization, and such authorizations should be clearly disclosed. In paragraph 4, for consistency sake, NACO supports the use of the State's HQT and/or CCS to determine mitigation that meets the State's objective to "…maintain the current quantity and quality of sage-grouse habitat…" when it is determined that additional mitigation, in addition to avoidance and minimization actions, would be required in order to actually "maintain the current quantity and quality of GRSG habitat".

3.5 3-8 P 1 & 2 Are all the disturbances described in Section 3.5 unmitigated? Or are some of these disturbances on track for required but have yet to be implemented mitigation? If so, this section should clarify that at least some of this disturbance will be mitigated.

APPENDIX F: Nevada and Northeastern California Mitigation Strategy Chapter Page Paragraph / Line / Figure / Table Comment Appendix F All All See previous comment related to mitigation Appendix F F-1 16 Change "net conservation gain" to "equivalent number of functional habitat acres", or adopt the State's definition of "net conservation gain". Note: the above comment applies in many locations throughout Appendix F whenever "net conservation gain" is used. Please make all the appropriate

changes. The "net conservation gain" as defined in the EIS is not consistent with the definition and application in the State Plan. While the State Plan does use the term "net conservation gain" the definition and practical application of this standard is different than the EIS definition of "The actual benefit or gain above baseline conditions." (EIS p. 7-75) The State Plan states that "Net conservation gain is defined as the State's objective to maintain the current quantity and quality of sage-grouse habitat within the SGMA at the statewide level by protecting existing sage-grouse habitat or by mitigating for loss due to anthropogenic disturbances" (emphasis added, p. 12). The State Plan also clarifies that net conservation gain is "accomplished through the Conservation Credit System" (p. 13). And, "residual adverse impacts are required to be offset by mitigation requirements as determined through the CCS" (emphasis added, p. 68). The CCS creates mitigation credits and debits based on "functional acres" and ensures that disturbed functional acres are replaced. This all clarifies that while the State Plan calls this "net conservation gain," in application is actually "no net loss" in functional habitat. Appendix F F-1 9-10 Specifically include "local governments" as one of the cooperating agency examples. Appendix F F-2 28-30 Revise to read "Where applicable, BLM would require use of the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes and mitigating impacts in habitat quality and quantity by providing equivalent number of functional habitat acres."

Strengthen and clarify protections for the most important habitat, including restoring no surface occupancy stipulations for oil and gas leasing and protections from geothermal development.

The BLM plan must also maintain a strong standard to avoid damage to habitat and to restore habitat where impacts are unavoidable.

In this case, the impact to habitat is necessary and due and does not require mitigation.

In both the No Action Alternative and the Management Alignment/Preferred Alternative, compensatory mitigation on public lands is not consistent with FLMPA, which does not authorize compensatory mitigation. FLPMA Section 302 (43 U.S.C §1732(b)) establishes the environmental protection standard that public land uses must prevent unnecessary or undue degradation. It does not require or authorize compensation or mitigation for unavoidable impacts (e.g., necessary and due impacts) associated with the use of public lands.

Further, for mineral activities conducted pursuant to the U.S. Mining Law, FLPMA specifically prohibits impairment of a claimant's rights under the Mining Law of 1872 43 U.S.C. § 1732(b). Pursuant to FLPMA and the U.S. Mining Law, BLM's discretionary authority is limited to prevent unnecessary or undue degradation, making the unnecessary or undue degradation standard the only mitigation standard consistent with claimants' rights under the U.S. Mining Law as amended by FLPMA. BLM does not have the authority to require mineral project proponents to provide mitigation, including compensatory mitigation, that exceeds the unnecessary or undue degradation standard.

Unnecessary or undue degradation must be determined on a site-specific basis to determine which impacts are avoidable (i.e., unnecessary and undue) and which impacts are unavoidable (i.e., necessary and due) in order to develop the mineral project. As a result, a one-size-fits-all mitigation standard or uniform ratio is not applicable to mineral projects. The FEIS should specify that compensatory mitigation does not apply to activities conducted pursuant to the U.S. Mining Law and authorizations under the 43 CFR Subpart 3809 regulations.

2 2-10 Table 2-2, Issue 4, Mitigation No-Action Alternative: The No Action Alternative remains ambiguous in its definition and application of "Net Conservation Gain" and has no consistent way of quantifying impacts and applying mitigation. As such, we oppose the No-Action Alternative. Management Alignment Alternative: The first paragraph must clarify, for consistency sake, if the BLM is implementing an "avoid, minimize and compensate" or "avoid, minimize and mitigate", and better define what it means in terms of the difference between "compensate" and "mitigate" and how these would be applied. The State is very clear in terms of requiring mitigation of all anthropogenic disturbance as determined through the CCS. Since the BLM has stated it cannot require mitigation in all circumstances, and that it cannot require use of the CCS, then the BLM needs to be clearer in terms of how it is "aligning" with the State Plan. In paragraph 2, we support utilizing the State's Habitat Quantification Tool (HQT) as a consistent means of tracking changes to habitat quantity and quality. The BLM references the State's "net conservation gain" standard, but to fully align with the State, the BLM must also adopt the State's definition where "Net conservation gain is defined as the State's objective to maintain the current quantity and quality of sage-grouse habitat within the Service Area at the statewide level by protecting existing sage-grouse habitat or by mitigating for loss due to anthropogenic disturbances. Mitigation requirements are determined by the Conservation Credit System. This objective will be measured by the credit to debit ratio." Currently, it is unclear as to whether the BLM is proposing to adopt this definition and apply this standard. Please clarify. Page 25 of 89 Paragraph 3 is very ambiguous in terms of the statement that "…mitigation would be considered subject to the federal regulations governing the authorization…" whereas the State is very clear in that "Mitigation will be required for all anthropogenic disturbances impacting sage-grouse habitat within the Service Area." Clarification needs to be provided in terms of how the BLM plans to align with the State Plan in circumstances where "…federal regulations governing the authorization…" do NOT allow for or mandate 'mitigation' following avoidance and minimization, and such authorizations should be clearly disclosed. In paragraph 4, for consistency sake, we support the use of the State's HQT and/or CCS to determine mitigation that meets the State's objective to "…maintain the current quantity and quality of sage-grouse habitat…" when it is determined that additional mitigation, in addition to avoidance and minimization actions, would be required in order to actually "maintain the current quantity and quality of GRSG habitat".

3.5 3-8 P 1 & 2 Are all the disturbances described in Section 3.5 unmitigated? Or are some of these disturbances on track for required but have yet to be implemented mitigation? If so, this section should clarify that at least some of this disturbance will be mitigated. Going forward, the BLM should not only track "disturbances" but also track disturbances that have been and will be mitigated versus those that have not. See County Needs Attachment

APPENDIX F: Nevada and Northeastern California Mitigation Strategy Chapter Page Paragraph / Line / Figure / Table Comment Appendix F All All See previous comments related to mitigation Appendix F F-1 16 Change "net conservation gain" to "equivalent number of functional habitat acres", or adopt the State's definition of "net conservation gain". Note: the above comment applies in many locations throughout Appendix F whenever "net conservation gain" is used. Please make all the appropriate changes. The "net conservation gain" as defined in the EIS is not consistent with the definition and application in the State Plan. While the State Plan does use the term "net conservation gain" the definition and practical application of this standard is different than the EIS definition of "The Page 45 of 89 actual benefit or gain above baseline conditions." (EIS p. 7-75) The State Plan states that "Net conservation gain is defined as the State's objective to maintain the current quantity and quality of sage-grouse habitat within the SGMA at the statewide level by protecting existing sage-grouse habitat or by

mitigating for loss due to anthropogenic disturbances" (emphasis added, p. 12). The State Plan also clarifies that net conservation gain is "accomplished through the Conservation Credit System" (p. 13). And, "residual adverse impacts are required to be offset by mitigation requirements as determined through the CCS" (emphasis added, p. 68). The CCS creates mitigation credits and debits based on "functional acres" and ensures that disturbed functional acres are replaced. This all clarifies that while the State Plan calls this "net conservation gain," in application is actually "no net loss" in functional habitat. Appendix F F-1 9-10 Specifically include "local governments" as one of the cooperating agency examples. Appendix F F-2 28-30 Revise to read "Where applicable, BLM would require use of the State of Nevada's Habitat Quantification Tool (HQT) to ensure consistency in tracking/reporting changes and mitigating impacts in habitat quality and quantity by providing equivalent number of functional habitat acres."

The Board would appreciate the BLM adopting the State's definition of "Anthropogenic Disturbance" that does NOT include range improvements.

There is no legal authority to require such compensatory mitigation. The BLM enabling legislation does not require net conservation gains.

Pilot projects should continue to be implemented to fine tune mitigation options. Suggest changing to the mitigation standard to make it appropriate and consistent with applicable legal authorities. Mitigation would be most appropriate in priority habitat and general management areas, when BLM is authorizing facilities or activities that result in loss of habitat that would have long-term (i.e., greater than 5 years) negative impact on greater sage- grouse or their habitats. The County suggests this mitigation requirement be phased in over the next 25 years as sage grouse habitat mitigation science evolves. In the meantime, the goal should be to develop pilot projects for compensatory mitigation in each County in Nevada and partner on developing achievable standards for mitigation.

C.4.8 Exceptions/Variances from Non-Fluid Mineral Sage-Grouse Restrictions

Allocation Exception Process BLM acknowledges that ". . .landscape level mapping may not accurately reflect on-the-ground conditions." (DEIS at 2-6) and states "[ ] Need for adjusting habitat management areas (HMAs) so that they reflect the best available science" (DEIS at ES-3). PGC is concerned that the Allocation Exception Process is too narrow and rigid to give BLM the necessary flexibility to use best available science (e.g., field-verified data) and to make project-specific decisions in GSG habitat based on actual, field-verified habitat data. The allocation exception process needs to state clearly that one of the circumstances which always requires an allocation exception is when a project applicant provides on-the-ground habitat data collected by a qualified biologist using BLM-approved data collection protocols that documents different habitat conditions than on Figure 1-2b. BLM should be required to base project decisions on actual field-verified habitat conditions rather than on the habitat management classifications shown on Figure 2-1b. Therefore, whenever BLM has field-verified habitat data that have been provided by a project proponent, the State of Nevada, or otherwise obtained by BLM, BLM must use this information in making land use decisions. In these circumstances, the landscape management area classification map (e.g., Figure 2-1b) cannot be used as the basis for BLM's decision. The restrictions that apply to the PI-IMA management classification must not be required on lands that are GHMA, OHMA, or non-habitat based on field-verified habitat conditions. Similarly, the restrictions that apply to GHMA must not be required on lands that are OHMA or non-habitat based on field-verified habitat conditions. Because BLM is compelled to use best available science, granting an allocation exception should be the

standard operating procedure that does not require the State Director's authorization. BLM District Managers should be authorized to grant allocation exceptions whenever BLM is provided with field-verified habitat data that conflicts with Figure 2-1 b. As stated elsewhere, the land use restrictions in the amended 2018 GSG LUP cannot substantially interfere with a claimant's rights under the U.S. Mining Law including the rights of ingress and egress, and reasonable use and occupancy for mineral exploration and development purposes.

The following discussion of the Allocation Exception Process as presented in Table 2-2 is poorly worded and confusing: "Verify use of landscape-scale mapping of PHMA, GHMA, and OHMA in regards to the application of allocations and stipulations." (DEIS at ES-3 and 2-12). As written, this appears to contradict the DEIS provisions pertaining to modifying habitat management area designations based on field-verified habitat data and diminish or even eliminate the need for an exception process. To make the allocation exception process consistent with the procedures outline to modify habitat management area designations PGC suggests this sentence needs to be re-written to say: "Use field-verified habitat data whenever available to make project-specific decisions and to apply allocation exceptions and stipulations." Similarly, the sentence on Table 2-2 stating "In PI-IMA and GHMA, the State Director may grant an exception to the allocations and stipulations described in Section 2-5 if one of the following applies... " is circular and confusing because Table 2-2 is the only content in Section 2.5.

In EIS Table 2-2, page 2-12, better definition is needed as to exception criteria under the Management Alignment Alternative. This should include a definition of impacts too small to address under the criteria, a definition of habitat fragmentation, and inclusion of all mining exemption criteria in addition to valid existing rights.

Allocation Exception Process No-Action Alternative: The County does not support this approach as it is inconsistent with the Nevada Sage-grouse Conservation Plan as well as the county's needs. It is also inconsistent among allocations and does not clearly provide exceptions for the following: county emergency response; issues related to public health and safety; and, standard administrative functions performed by local government for public benefit. Management Alignment Alternative: The County generally supports this Alternative and greatly appreciates the inclusion of items iii., iv., v., and vi, from Table 2-2, pages 2-13 to 213.

The 2018 Draft EIS dramatically expands the use of exceptions to all "allocations and stipulations described in Section 2-5" for PHMA and GHMA, including habitat management area designations (2-6), adaptive management (2- 8), mitigation (2-10), and habitat objectives (2-15). Id. at 2-12. This arbitrary and ill-defined process completely undermines the regulatory certainty that Greater sage-grouse require in order to avoid an ESA listing. See generally 80 Fed. Reg. at 59,858-59,942 (repeatedly referencing the importance of allowing only "limited" exceptions to allocations and stipulations). Under the "allocation exception process," BLM may grant an exception to the ARMPA's "allocations and stipulations" if just one of several criteria are met. However, as explained below, those criteria are vaguely worded and would allow BLM to issue blanket exceptions for nearly any activity regardless of impacts on Greater sage-grouse.

The State Director may grant an exception if the location is "determined to be unsuitable" by a "qualified biologist with Greater Sage-Grouse experience." 2018 DEIS at 2-12, E-2. But that criteria leaves unsaid for whom the biologist works. There is no requirement that the biologist represent the public or federal government's interest in protecting the greater sage-grouse from listing, or that any kind of consultation

take place with the Nevada Division of Wildlife (NDOW). A narrow exception in the 2015 RMP specified that the analysis must be conducted by a "field biologist or other GRSG expert from each respective agency." NV/CA ARMPA at G-10. That requirement that the biologist work for a government agency is conspicuously missing from the 2018 Draft EIS. For example, the biologist may work for, or serve under contract with, a project proponent. Also, as more studies are conducted regarding greater sage-grouse habitat, science is finding more populations and suitable habitat than previously known. Preemptively designating an area as "unsuitable" for Greater sage-grouse habitat is contrary to the Coates' studies that continue to find habitat where it had not previously been thought to exist. 2. The State Director may grant an exception if the "proposed action would be authorized to address public health and safety concerns, specifically as they relate to local, state, and national priorities." NV/CA Draft EIS at 2-12. While we do not oppose projects that truly improve public health and safety, the use of the word "priorities," under the guise of "health and safety," appears as an open invitation or loophole for road building and vegetation management throughout Greater sage-grouse habitat. Any "health and safety" exception should state that the project must specifically demonstrate a direct, imminent, and tangible link to the health and safety of human individuals. The plan should explicitly prohibit use of the exception to build or maintain roads, or treat vegetation, that would benefit extractive industries or grazing interests with negligible improvement to public safety. 3. The State Director may grant an exception for "renewals or re-authorizations of existing infrastructure in previously disturbed sites or expansions of existing infrastructure that have de minimis impacts or do not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and its habitat." NV/CA Draft EIS at 2-13. First, the second "or" should be an "and" in order to prevent collectively minor, but cumulatively significant, impacts from de minimis activities. Second, the exception also should define de minimis and not allow any expansion of existing facilities in PHMA. Finally, no exception should be granted if the expansion of existing infrastructure will exceed applicable density and disturbance caps, unless doing so will achieve a "net conservation gain" for the species. 4. The State Director may grant an exception for "a routine administrative function conducted by State or local governments, including prior existing uses, authorized uses, valid existing rights and existing infrastructure (i.e. rights-of-way for roads) that serve such a public purpose." NV/CA Draft EIS at 2-13. We do not disagree with appropriate exceptions for valid existing rights, which already are recognized in the current plan. 2015 RMP at 1-13. However, this exception goes well beyond valid existing rights by recognizing "existing uses," an extremely broad term that could introduce a wide range of harmful activities into sage-grouse habitat, particularly in regard to road use, construction, and maintenance. As such, BLM must remove this overbroad exemption from protections for the greater sage-grouse. Valid existing rights already are covered by the current 2015 ARMPA. 5. The State Director may grant an exception for lands identified for retention in the plan, but "identified for disposal through previous planning efforts. . . ." 2018 DEIS at 2-13. Lands identified for retention in the plan include PHMA and GHMA. Id. at 2-5. Disposal of these lands should be disallowed, absent a clear and compelling need to override the national importance of retaining these lands in federal ownership. Finally, BLM must evaluate proposed exceptions through an open and transparent public process. This should include opportunities for the public to review and comment on proposed exceptions, as well as the opinions of expert agencies. The views of expert agencies, as well as the public, must also be given due weight during the evaluation process.

BLM must limit, not broaden, waivers, exceptions, and modifications for fluid minerals stipulations. We have a number of concerns for proposed changes to the application and scope of proposed changes to waivers, exceptions, and modifications to fluid minerals stipulations: * First, under the 2015 ARMPA, BLM must apply a "no surface occupancy" (NSO) stipulation to new oil and gas leases in PHMA - and the

BLM may not grant waivers or modifications to those stipulations (only a limited exception is allowed). By contrast, the 2018 Draft EIS contains a broader range of exceptions, including if the habitat is determined to be unsuitable by a "qualified biologist." NV/CA Draft EIS at E-4. Our concerns for the use of this approach ("qualified biologists") are discussed above in the section on the "allocation exception process." * Second, the 2015 ARMPA did not permit waivers or modifications to NSO stipulations in PHMA, due to the importance of limiting surface disturbance and ensuring consistent application across PHMA. NV/CA ARMPA at N-4-5. But the 2018 Draft EIS proposes to allow waivers and modifications "if the Authorized Officer, in consultation with the appropriate state agency (NDOW and/or CDFW), determines that the entire leasehold is within unsuitable habitat … and would not result in direct, indirect, or cumulative impacts on Greater Sage-Grouse and/or its habitat," the BLM may waive the entire stipulation. Id. at E-4. Waiving the stipulation for an "entire leasehold" would remove the certainty FWS relied upon when determining that the 2015 RMP would protect the greater sage-grouse and its habitat. * Third, BLM is proposing to eliminate the important role played by expert agencies, including FWS, NDOW, and California Department of Fish and Wildlife (CDFW), in reviewing and sanctioning proposed exceptions. Under the 2015 ARMPA, BLM "may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action" would not have direct, indirect, or cumulative impacts on sage-grouse or would result in a "net conservation gain." NV/CA ARMPA at N-4-5. However, in spite of the stated purpose and need of this amendment process - i.e., "to enhance cooperation with the states" - BLM is now proposing to cut NDOW and CDFW (not to mention FWS) out of the review and approval process for proposed exceptions. Their existing roles must be retained. * Fourth, BLM is not requiring any sort of public notice or opportunity for review/comment in connection with proposed waivers, exceptions, and modifications. BLM should only make exceptions, waivers, and modifications through a transparent process, with advance notice to the public and an opportunity to comment. Further, BLM must track waivers, exceptions, and modifications and regularly share this information with the public.37 In sum, the 2018 Draft EIS wrongly contends that the proposed changes to waivers, exceptions, and modifications "would not have impacts on Greater Sage-Grouse and its habitat." NV/CA Draft EIS at ES9. BLM has no basis for that statement because the Draft EIS contains no analysis of the direct, indirect, and cumulative impacts of all the waivers, exceptions, and modifications that BLM will issue one-at-a time over a series of years. For example, while limited waivers may not jeopardize critical habitat, a series of waivers over the years could destroy the connectivity of an entire habitat range. Decisions on habitat must be made while looking at the landscape as a whole, using data and science and through consultation with expert agencies and the public, to make the best decisions to preserve the species. Preserving the sagebrush landscape, as well as the Greater sage-grouse species, requires consistent planning for the entire landscape and certainty that agreed upon conservation measures will be faithfully implemented - which, as confirmed by FWS's "not warranted" determination, is best accomplished through an RMP with narrowly-tailored waivers, exceptions, and modifications and with built-in safeguards, including mandatory consultation with expert agencies and the public. Overall, one-time exceptions should be the preferred approach where relief is sought from protective stipulations, such that the safeguards prescribed in these stipulations will remain in place for the majority of oil and gas leases. Waivers, exceptions and modifications should only be granted from no surface occupancy (NSO) stipulations or any stipulations in PHMA after a 30-day public notice and comment period.

37 We recognize that, in the Draft EIS, BLM suggests that proposed waivers, exceptions, and modifications will be evaluated in "[t]he environmental analysis document prepared for site-specific proposals", which would typically involve some degree of public participation. NV/CA Draft EIS at E-3.

However, this is not a binding commitment to conducting those analyses or engaging the public, and recent policy changes, particularly for oil and gas leasing and development, have eliminated public review and comment opportunities. See, e.g., BLM Instruction Memorandum 2018-034. Thus, in the Final EIS, BLM must commit to providing such opportunities for proposed waivers, exceptions, and modifications.

6-Further, the U.S. Fish and Wildlife Service should have the opportunity to submit information for consideration prior to granting waivers, exceptions and modifications. Finally, it is critical that BLM track waivers, exceptions and modifications requested and those granted, and make that information available to the public. These records will provide important insight into how the stipulations are being applied and the potential impact of waivers, exceptions and modifications on the overall function of the plans. This information will also allow BLM to determine if the availability of or criteria for granting waivers, exceptions and modifications needs to be further narrowed in order to ensure sufficient protection for sage-grouse habitat. Accordingly, in addition to the specific changes recommended above, we recommend that the Colorado EIS include language that provides: Exceptions will be considered prior to considering waivers or modifications. If the BLM determines that a waiver or modification is more appropriate, the reasons for such decisions will be documented. Waivers are permitted if the area lacks "protected attributes" - as determined through coordination with the appropriate state wildlife agency. Modifications and exceptions are permitted if: (1) impacts are fully and verifiably offset by compensatory mitigation; or (2) there are no impacts to greater sage-grouse because of terrain or habitat type, based on consultation with the applicable state wildlife agency. For NSO stipulations or stipulations in PHMAs, waivers exceptions and modifications will only be granted following a 30-day public notice and comment period.

1- Moreover, American Bird Conservancy would like to address the Allocation Exception Process. Under the No-Action Alternative, there were different kinds of allocation standards for different resource developments in PHMAs outside of SFA. For geothermal, salable minerals, oil and gas, and wind energy, there needs to be a conservation net gain whenever there is development. This goes for land tenure and recreational development, as well. In some instances there needs to be scientific support for the allocation of the lands, and if the development does not meet an exception, PHMAs are closed off to it.

2- Now under the Preferred Management Alignment Alternative, the allocation standards are different. First, there are no separate guidelines for the different forms of development for allocation. Instead, the State Director may grant an exception to the allocation if proposed development meets ones on of the flimsy criteria required for authorization. Second, the criteria does not emphasize the need for conservation net gain. Unlike the No-Action Alternative that required a clear conservation gain for the Greater Sage-Grouse, the Bureau's preferred alternative's lack of emphasis on a net conservation gain for allocation weakens conservation efforts for the Greater Sage-Grouse and its habitat. It would allow third parties to come into PHMAs and GHMAs and disregard the need to preserve the grouse when it attempts to develop the lands. Redefining the guidelines under the Allocation Exception Process with elements of the conservation alternative would hold third parties up to a higher standard when they decide to encroach into Greater Sage-Grouse habitats.

The BLM should restore No Surface Occupancy stipulations as mandatory for sage-grouse habitat when leasing for energy development

The SETT recommends more specifics and definitions pertaining to the exceptions criteria.

1- For example, "location of the proposed authorization" does this include the project footprint or the analysis area as well?

2-What are the criteria for "lacks ecological potential to become suitable habitat"?

3- Is the HQT to be used to determine direct, indirect, and cumulative impacts?

4-What is the definition of "habitat fragmentation"?

5- How would de minimis impacts be determined?

6- The SETT requests further clarification, potentially in an appendix.

Allocation Exception Process: The County does NOT support the "No Action Alternative" for the following reasons. Both the above comments on SFAs and the following comments document the County's concerns with being able to carry out emergency and administrative functions under the 2015 LUP. The County is concerned with being able to carry out both emergency and regular administrative functions that are important to the health and safety of our citizens. Such services often need to be carried out in a timely manner (i.e. emergency repairs) and/or during the optimal time of year (i.e. standard maintenance). The 2015 LUP and associated restrictions on travel, access to public lands including existing infrastructure, other limitations are of great concern to the County and must be resolved through this planning effort. The County supports the "Management Alignment Alternative" for the following reasons. The County fully supports the exceptions for actions that address public health and safety concerns (Item 'ii.' on Page 2-13 under "Management Alignment Alternative"), as well as actions that are routine administrative functions (Item 'v.' on Page 2-13 under "Management Alignment Alternative"). Such exceptions must be provided in a timely manner and/or programmatically through an MOU or other mechanism to ensure timely response time to emergency situations, as well as implementation of normal maintenance actions at the most appropriate time of year. This approach is more consistent with the County's Master Plan and required provision of services than is the No Action Alternative.

The exemption process should apply equally to MD RE 3 that otherwise excludes without exception wind energy development in priority habitat. Doing so would bring wind energy development under the authority of the State Director to grant exceptions where impacts from the proposed action could be offset through the use of the mitigation hierarchy. There is no reasoned basis to apply that exception process only to wind energy facilities for onsite power generation and not to all wind energy facilities in priority habitat.

The plans contain many new provisions that serve as loopholes and exceptions to habitat protections. We need certainty that crucial habitat will be protected to ensure the species thrives into the future.

1-one-time exceptions should be the preferred approach where relief is sought from protective stipulations, such that the safeguards prescribed in these stipulations will remain in place for the majority of oil and gas leases.

2- In such cases, FWS should have the opportunity to submit information for consideration prior to granting waivers, exceptions and modifications.

3-Finally, it is critical that BLM track boundary adjustments, waivers, exceptions and modifications requested and those granted, and make that information available to the public. These records will provide important insight into how the plans' requirements are being applied and the potential impact of such changes on the overall function of the plans. This information will also allow BLM to determine if the availability of or criteria for granting waivers, exceptions and modifications needs to be further narrowed to ensure sufficient protection for sage-grouse habitat.

Language that permits widespread exceptions to protections should be removed; this is a path to poorly planned development, leading to fewer birds and less habitat.

C.4.9 Seasonal Timing Limitations

As discussed in Section IX, VERs granted by the U.S. Mining Law at 30 U.S.C. § 22 and FLPMA at 43 U.S.C. § 1732(b) provide rights of ingress and egress for the purpose of exploring for or developing minerals. The travel management restrictions and seasonal and spatial use and occupancy constraints in the GSG LUPs cannot substantially interfere with these ingress and egress rights. Consequently, the travel restrictions applicable to PHMA and GHMA shown on Figure 2-13b cannot apply to travel that is necessary for mineral purposes under the U.S. Mining Law. The 2018 FEIS and LUP need to make it clear that the restrictions shown on Figure 2-13b cannot be applied as 24/7 access restrictions precluding travel that is necessary for mineral exploration and development. On a project- and site-specific basis, certain time of day or seasonal restrictions of a limited duration may be appropriate. However, these restrictions cannot create significant barriers to mineral activities.

3.2 Seasonal Restrictions Perhaps even more difficult for WREC than the inconsistencies within lek buffers are the overly harsh and unrealistic application of seasonal restrictions. While Table ES-2 Executive Summary and Table 1-2 in Chapter 1 in the RMPA/EIS state that changes to seasonal restrictions would create alignment with state regulations from Nevada and California, the actual changes under Alternative B are minimal. The current Plan and Alternative A call for the following seasonal restrictions: 1. In breeding habitat within 4.0 miles of active and pending greater sage-grouse leks from March 1 through June 30: a. Lek - March 1 to May 15 b. Lek hourly restrictions - 6 p.m. to 9 a.m. 2. Brood-rearing habitat from May 15 to September 15 a. Early - May 15 to June 15 b. Late - June 15 to September 15 3. Winter habitat from November 1 to February 28 POWER ENGINEERS, INC. PAGE 3 Unfortunately, while likely intended for application with site-specific data, all of these seasonal restrictions are being placed on all areas of PHMA by local BLM field offices on recent WREC right-of-way (ROW) applications. This leaves WREC a seasonal window of September 16 to October 31 to conduct any and all construction activities or operation and maintenance activities. While the Executive Summary and Chapter 1 lead the reader to believe these overly-restrictive dates were alleviated under Alternative B, this is not the case. Alternative B would apply these same restrictions and only allows for modification of seasonal restriction dates if the project serves to protect or enhance greater sage-grouse and their habitats (i.e., habitat improvement projects). By not altering the seasonal restrictions in the RMPA/EIS, seasonal restrictions being placed on WREC ROW applications will continue to allow only six weeks throughout the entire year when activities can take place in PHMA. This is overly restrictive and should be remedied in the Final RMPA/EIS. WREC does not, nor have they ever, opposed seasonal restrictions when the best available data supports their applications. Additionally, it is known that sage-grouse occupy different seasonal habitat throughout the year as indicated by the various seasonal restrictions. However, it is not correct to assume that one area occupied by one ROW provides suitable habitat for leks, early brood-rearing habitat, late broodrearing habitat, and winter

habitat. WREC requests that habitat definitions be added to the RMPA/EIS so that the restrictions can be easily matched with the correct habitat types, thus alleviating their overly restrictive applications.

The NvMA supports the changes in seasonal timing restrictions as outlined in the Management Alignment Alternative since it provides additional flexibility and opportunity for state input.

Inconsistencies still exist concerning the establishment of seasonal land restrictions and other decision-making activities in Nevada as they relate to the interaction between the federal land managers and Nevada's Sagebrush Ecosystem Technical Team.

Seasonal Timing Restrictions No-Action Alternative: The County does not support the approach included in this Alternative as there is no exception for the following: emergency response; issues related to public health and safety; and, standard administrative functions performed by local government for public benefit. There is also no ability to provide an exception for activities within a 4-mile buffer of leks, even if topographic, vegetative or existing infrastructure are resulting in no impact to the lek. Management Alignment Alternative: The County generally supports this portion of the Alternative and greatly appreciates the added ability to modify or remove seasonal timing restrictions based on factors that would allow needed activity while not having long-term negative impacts to GRSG. Neither the No-Action nor Management Alignment Alternative have any language recognizing that these timing restrictions are to avoid visibility and audibility impacts to sage-grouse. The exceptions do not seem to account for the primary factor influencing visibility and audibility: topography.

2 2-12 and 13 Table 2-2 Allocation Exception Process, Section iii, iv and v. The process as described in the proposed action needs to be streamlined as to address emergency scenarios as well as routine and regular maintenance of existing infrastructure, (roads). -As is described in Seasonal Timing Restrictions.

The Management Alignment Alternative introduces additional reasons for waiving or modifying existing seasonal restrictions for activities that are disruptive to the Greater Sage-Grouse near leks, nesting habitat, brood-rearing habitat, or winter habitat. The wording allowing for modifications and waivers for seasonal restrictions is broadly worded and likely to be broadly interpreted. The Management Alignment Alternative amendments will increase disturbance in crucial habitats during critical seasonal periods.

We currently graze the sagebrush lands and refrain from grazing the Bitner meadow until approximately mid-August so the sage grouse can raise their chicks on the meadow with minimal disturbances. The seasonal timing restrictions in Table 2-2 under the No-Action Alternative are overly restrictive for grazing if applied to the entire allotment. The seasonal dates should be specific to each allotment and flexible to match the current year’s weather/climate conditions. Prescribed grazing of the meadow according to yearly conditions allows the meadow to have new growth for livestock as well as all wildlife the following year.

LCPD's concerns with Alternative B and seasonal restrictions include a lack of defined areas where these seasonal restrictions should be put in place.

Alternative B would apply these same restrictions and only allows for modification of seasonal restriction dates if the project serves to protect or enhance greater sage-grouse and their habitats (i.e., habitat improvement projects). By not altering the seasonal restrictions or defining specific areas where they are to be applied, seasonal restrictions may allow only six weeks throughout the entire year when

activities can take place in PHMAs. This is overly restrictive and should be remedied in the Final RMPA/EIS.

Seasonal Timing Restrictions: The County does NOT support the "No Action Alternative" for the following reasons. The inflexibility of timing restrictions on use of roads, as well as regular maintenance and emergency repairs, within a certain distance of leks or seasonal habitat creates unnecessary harms (especially combined with the erroneous mapping). The same can be said for other existing County infrastructure (i.e. radio towers, gravel pits, etc.). The County supports the "Management Alignment Alternative" for the following reasons. Exemptions from Seasonal Timing Restrictions for County activities including matters of normal administrative function and emergency or human safety matters are necessary for the County to provide regular services in order to serve and protect its citizens. While the County supports inclusion of Item 'ii.', page 2-15 under the "Management Alignment Alternative", we would further request a provision for regular administrative functions similar to the Allocation Exception Process, Item 'v.' on page 2-13.

2 2-15 Table 2-2, Issue 6, Seasonal Timing Restrictions No-Action Alternative: NACO does not support this approach as there is no 1-exception for the following: county emergency response; issues related to public health and safety; and, standard administrative functions performed by local government for public benefit.

2-There is also no ability to provide an exception for activities within a 4-mile buffer of leks, even if topographic, vegetative or existing infrastructure are resulting in no impact to the lek. Management Alignment Alternative: NACO generally supports this alternative and greatly appreciates the added ability to modify or remove seasonal timing restrictions based on factors that would allow needed activity while not having long-term negative impacts to GRSG. 3-Neither the No-Action nor Management Alignment Alternative have any language recognizing that all these timing restrictions are to avoid visibility and audibility impacts to sage-grouse. The exceptions do not seem to account for the primary factor influencing visibility and audibility: topography. Please add to the end of the sentence in (i)(b) in Alt B "or local data, topography, and other factors reduce visibility and audibility impacts to sage grouse."

Consequently, the travel restrictions applicable to PHMA and GHMA shown on Figure 2-13b cannot apply to travel that is necessary for mineral purposes under the U.S. Mining Law. The 2018 FEIS and LUP need to make it clear that the restrictions shown on Figure 2-13b cannot be applied as 24/7 access restrictions precluding travel that is necessary for mineral exploration and development. On a project- and site-specific basis, certain time of day or seasonal restrictions of a limited duration may be appropriate. However, these restrictions cannot create significant barriers to mineral activities.

2-15 Table 2-2, Issue 6, Seasonal Timing Restrictions No-Action Alternative: We not support this approach as there is no exception for the following: emergency actions; issues related to human health and safety; and, standard administrative functions performed by local government for public benefit. There is also no ability to provide an exception for activities within a 4-mile buffer of leks, even if topographic, vegetative or existing infrastructure are resulting in no impact to the lek. Management Alignment Alternative: We generally support this alternative and appreciate the added ability to modify or remove seasonal timing restrictions based on factors that would allow needed activity while not having long-term negative impacts to GRSG. However, neither the No-Action nor Management Alignment Alternative have any language recognizing that all these timing restrictions are to avoid

visibility and audibility impacts to sagegrouse. The exceptions do not seem to account for the primary factor influencing visibility and audibility: topography. Please add to the end of the sentence in (i)(b) in Alt B "or local data, topography, and other factors reduce visibility and audibility impacts to sage grouse." We also request addition of an item iii that would read the same as v from the section on Allocation Exception Process in regard to carrying out normal administrative functions of the benefit of the public.: iii. The proposed action would be determined a routine administrative function conducted by State or local governments, including prior existing uses, authorized Page 27 of 89 uses, valid existing rights and existing infrastructure (i.e. rights-of-way for roads) that serve such a public purpose.

The Board would appreciate the BLM adopting flexibility to seasonal timing restrictions that relate to grazing, in order to allow for common-sense management that provides for both public land grazing and Sage-grouse conservation.

C.4.10 Lek Buffers

Lek Buffer Zones The lek buffer zone restrictions in Appendix B of the 2018 DEIS are an improvement over Appendix B in the 2015 FEIS/LUPs, because the 2018 version of Appendix B does not include compensatory mitigation. Nonetheless, the lek buffers are rigid, distance-based, one-size-fits-all measures premised on landscape-scale land use planning concepts as presented in the 2014 USGS report entitled "Conservation Buffer Distance Estimates for Greater Sage-Grouse - A Review" (Open File Report 2014 - 1239). The current lek buffer zones restrict infrastructure related to energy development within 3.1 miles of leks, tall structures within 2 miles of leks, low structures within 1.2 miles of leks, surface disturbance that alters vegetation within 3.1 miles of leks, and projects creating noise to at least 0.25 miles from leks. (Appendix B at B-1). These restrictions have the potential to put millions of acres of land off-limits to multiple use. BLM should eliminate the lek buffer zone restrictions outlined in Appendix B because they are premised on landscape scale land use policies that this administration and Congress have revoked. PGC recognizes that it may be appropriate to limit or even preclude certain activities near active leks during the active breeding season. However, the 2018 DEIS applies these restrictions throughout the year. Once the lek breeding season is over for the year, the lek buffer zone restrictions should not apply. Consistent with the provisions for modifying habitat management area designations based on field verified habitat data, implementing the lek buffer zone restrictions should require current lek occupation data, which should be defined as best available science in the context of imposing a lek buffer zone. Other site characteristics including landscape features (e.g., topography) which shield a project from a nearby lek and lessen or even eliminate any impacts from the proposed land use activities must be considered in the lek buffer zone determination. At many sites the resulting buffer zone could be much smaller than the current one-size-fits all approach. Additionally, any restrictions that are warranted to protect occupied leks during the breeding season must respect claimants' rights under the U.S. Mining Law. For exploration programs this may mean limiting the hours of operation or short-term seasonal restrictions during the active lekking season if impacts from the drilling activities are not reduced by topography. For an active mining operation, it may not be feasible to eliminate direct or indirect impacts to leks. FLPMA Section 302(b) authorizes such unavoidable impacts for mining activities pursuant to the U.S. Mining Law. BLM is not authorized to prohibit such activities or to require mitigation.

The lek buffer zone restrictions in Appendix B of the 2018 DEIS are an improvement over Appendix B in the 2015 FEIS/LUPs, because the 2018 version of Appendix B does not include compensatory mitigation. Nonetheless, the lek buffers are rigid, distance-based, one-size-fits-all measures premised on

landscape-scale land use planning concepts as presented in the 2014 USGS report entitled "Conservation Buffer Distance Estimates for Greater Sage-Grouse - A Review" (Open File Report 2014 - 1239). The current lek buffer zones restrict infrastructure related to energy development within 3.1 miles of leks, tall structures within 2 miles of leks, low structures within 1.2 miles of leks, surface disturbance that alters vegetation within 3.1 miles of leks, and projects creating noise to at least 0.25 miles from leks. (Appendix B at B-1). These restrictions have the potential to put millions of acres of land off-limits to multiple use. BLM should eliminate the lek buffer zone restrictions outlined in Appendix B because they are premised on landscapescale land use policies that this administration and Congress have revoked. PGC recognizes that it may be appropriate to limit or even preclude certain activities near active leks during the active breeding season. However, the 2018 DEIS applies these restrictions throughout the year. Once the lek breeding season is over for the year, the lek buffer zone restrictions should not apply. Consistent with the provisions for modifying habitat management area designations based on field verified habitat data, implementing the lek buffer zone restrictions should require current lek occupation data, which should be defined as best available science in the context of imposing a lek buffer zone. Other site characteristics including landscape features (e.g., topography) which shield a project from a nearby lek and lessen or even eliminate any impacts from the proposed land use activities must be considered in the lek buffer zone determination. At many sites the resulting buffer zone could be much smaller than the current one-size-fits all approach. Additionally, any restrictions that are warranted to protect occupied leks during the breeding season must respect claimants' rights under the U.S. Mining Law. For exploration programs this may mean limiting the hours of operation or short-term seasonal restrictions during the active lekking season if impacts from the drilling activities are not reduced by topography. For an active mining operation, it may not be feasible to eliminate direct or indirect impacts to leks. FLPMA Section 302(b) authorizes such unavoidable impacts for mining activities pursuant to the U.S. Mining Law. BLM is not authorized to prohibit such activities or to require mitigation.

The County supports the clarification as to the application of lek buffers and encourages the BLM to allow regular administrative services and emergency services within lek buffer areas when required to provide expected services to the citizens of this County.

The Nevada DEIS concedes a lack of clarity with respect to the imposition of Lek buffers as an element of the LUPA. Nevada DEIS at ES-5 In general, the imposition of uniform lek buffer distances without regard for site specific project impacts ignores the unique circumstances and habitat impacted by most project operations. Notwithstanding an enthusiasm exhibited in the 2015 Nevada GRSG LUPA for lek buffer uniformity, and even with accommodation to modify lek buffer requirements based on local data, best available science, landscape features, and other existing protections (e.g. land use allocation state regulations), there is little scientific basis for any default standard of lek buffers to be applied by the BLM in project specific context. See Appendix B. Instead, lek buffers must be developed in conjunction with local knowledge of GRSG seasonal movements and population responses to management actions. For the Nevada LUPA, lek buffers must be analyzed to provide greater flexibility and adaptability to make changes to buffers as new information and science becomes available and if the site will allow for a more flexible approach. Page Twenty-One But more importantly, Commenters pause to offer how the imposition of potentially inflexible lek buffer requirements potentially collide with the full range of applicable laws that authorize and encourage mining on public lands, including the General Mining Law of 1872, the Surface Use Act, the Mining and Materials Policy Act, FLPMA, and the implementing regulations of those statutes. Commenters are concerned by how the Nevada DES refers to the rights under the mining laws and the disjointed methodology in which the Nevada DEIS uses shorthand

descriptions to characterize the scope and sources of rights under the 1872 Mining Law. Consideration should be given to include LUP revisions that allow for reconciliation of potential conflicts and implementation of existing surface management regulations (43 CFR Subpart 3809) in order to appropriately complement baseline land use planning with appropriate analysis of project impacts at the project specific level.

EPA recommends that the Final EIS clarify the basis for determining that project specific analyses should rely on the lower end of the lek buffer distances as the default.

New development should be prioritized outside these important population areas and strong buffers maintained around sage-grouse leks.

This inconsistency between restricting development within three miles of a lek (GRSG-GEN-GL-010-Guideline) and the blanket restriction of all development within PHMAs (GRSG-LR-SUA-ST-014-Standard) still exists under both Alternative A and Alternative B in the Draft RMPA/EIS and must be rectified.

Indirect impacts, particularly from raven predation, that capitalize on powerlines can significantly affect nest success as females are moving on and off nests/leks. The SETT requests the BLM incorporate the new research to extend to some point beyond 2 miles.

1 1-9 Table 1-3, Row 1, Modifying Lek Buffers NCA asserts that any use of lek buffers and associated modifications must be included for analysis in this EIS, not left for clarification through plan maintenance, because lek buffers were not fully analyzed in the previous EIS nor provided for public review and consideration. Based on the Administrative Record from the previous EIS, lek buffers were initially discussed during August 2014 agency meetings. The USGS was directed to do a "quick literature search to harvest the latest research results on buffers to contrast with what we currently have in our administrative draft proposed plans." WO_0000196. In September 2014, Deputy Assistant Secretary Jim Lyons acknowledged the failure to use "best available science" in analyze lek buffers in the DEIS. WO_0001457. Additionally, a DOI biologist expressed concerns that "the way the buffers have been written into the document as [required design features] really makes them management measures not analyzed in the drafts" and "avoiding the NEPA process by including un-analyzed management actions in an appendix". WO_0048001. Finally, the Solicitor's office had concerns about the new studies requiring an SEIS: "It will be important for the agency to have a record showing how it evaluated the USGS studies and why it determined that a supplemental analysis was not warranted." GBR_0010440, GBR_0010453. If BLM believes this issue was properly analyzed with no supplemental analysis previously, BLM needs to cite to the previous analysis and document it here.

1 1-9 Table 1-3, Row 1, Modifying Lek Buffers Regardless of whether BLM analyzes lek buffers in this EIS or wishes to pursue this as a clarification issue, NCA supports a change from "apply lek buffers" to "utilize the lek buffer-distances." Based on the discussion below, at a minimum, the new language for SSS 2(D) and SSS 3(C) should be revised to read "In undertaking BLM management actions [in PHMA and GHMA], and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will utilize the general lek buffer-distances and guidance identified in the USGS' Open File Report 20141239 to establish the evaluation area around leks that will be used to analyze impacts during project specific NEPA, including logical and scientifically justifiable departures based on local data, topography, and other factors, in accordance with Appendix B. This EIS must document that the cited

USGS OFR 20141239 report recognized that the area around a lek that is sensitive for sage grouse is not always a simple "radii" buffer and that "logical and scientifically justifiable departures…based on local data and other factors may be warranted when implementing buffer protections…" (p. 2). The USGS report states that "We do not make specific management recommendations but instead provide summarized information, citations, and interpretation of findings available in scientific literature. We also recognize that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range" (p. 1, emphasis added). The report clarifies that that impacts to leks are due to "influence of roads and infrastructure with topography and habitat conditions (visibility and audibility)…" (p. 6). In simple terms, even if within a lek buffer, if a human disturbance cannot be seen nor heard by sage grouse on the lek because of topography and other natural conditions, that area of the lek buffer could be clipped from the buffer. In the previous Administrative Record, the principal author of the USGS lek buffer report recognized the importance of locality in cautioning that the results of his literature search conducted for BLM to justify the new lek buffers did not provide a "simple, one-size-fits-all solution that was based solely on science" explaining that many of the complications are not "specified biologically" explaining that "scientific results will not provide all answers needed to" render the BLM's desired outcome: In the end, trying to balance political and conservation desires and needs with what we understand to be the basic biological requirements of the species of concern (Sage-grouse in this case) is the hard work…our collective ability to "respect biological requirements" for conservation while allowing for nuances based on social impetus (e.g., NSO or closure of seasonal habitats in one state versus strict use of buffers and seasonal closures/limits in another state could both be viable options for protection of nesting habitat) that can incorporate local understanding and social needs is the task at hand." WO_0035879. As referenced in the Administrative Record, there was addition of the new and universally applicable 1.2-mile buffer zone for fences that was not supported by the USGS report. In an April 2015 e-mail between Michael Bean, Sarah Greenberger, and Jim Lyons: "…the USGS report identifies only certain types of fences in certain types of terrain as a collision risk. By imposing a buffer requirement for all types of fences in all types of terrain, the BLM will impose a restriction for which the report offers no basis…If we want to anchor our plans in the USGS report, then the way to do that is to require that new fences (of the types described in the report) be placed at least 1.2 miles from leks in flat or rolling terrain . . . that is probably better than the alternative of lumping all fences together, regardless of type and location." WO 29247, WO 29250 (emphasis added). Despite the acknowledgement that the universal 1.2-mile buffer requirement for all fences does not adhere to the recommendations of the 2014 USGS study, it continues to be a requirement that has no scientific basis. The USGS Report does not recommend uniform or prescriptive lek buffer distances and instead presents a range of lek-buffers. The USGS report does not support the categorical 1.2-mile buffer requirement for all fences.

Appendix B are inadequate to protect leks so as to require the addition of temporal buffers that, in some instances, greatly expand the buffers in breeding habitat. The final EIS/RMP should eliminate temporal buffers as redundant to spatial buffers. Furthermore, the concept of "pending leks" should be eliminated as inconsistent with other state BLM plans such as the Idaho plan that has no definition for or concept of "pending leks."

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fences that was not supported by the USGS report. In an April 2015 e-mail between Michael Bean, Sarah Greenberger, and Jim Lyons: "…the USGS report identifies only certain types of fences in certain types of terrain as a collision risk. By imposing a buffer requirement for all types of fences in all types of terrain, the BLM will impose a restriction for which the report offers no basis…If we want to anchor our plans in the USGS report, then the way to do that is to require that new fences (of the types described in the report) be placed at least 1.2 miles from leks in flat or rolling terrain . . . that is probably better than the alternative of lumping all fences together, regardless of type and location." WO 29247, WO 29250 (emphasis added). Despite the acknowledgement that the universal 1.2-mile buffer requirement for all fences does not adhere to the recommendations of the 2014 USGS study, it continues to be a requirement that has no scientific basis. In discussing roads, the USGS Report includes the following observations: "…it is important to recognize that . . . not all roads have the same effect…the influence of individual roads or networks of roads on sage-grouse habitat use and demographic parameters remains a research need. This is a good example of the challenge associated with making clear interpretations of the effect area (and therefore, a definitive buffer distance) for these types of infrastructure" (pp. 5-8). The USGS Report does not recommend uniform or prescriptive lek buffer distances and instead presents a range of lek-buffers. The USGS report does not support the categorical 1.2-mile buffer requirement for all fences. Site specific factors need to be taken consideration such as line of site between the lek and project, topographical relief, quality of site-specific habitat, current bird activity, probability of sagegrouse nesting within the entire radius area, duration of the project/use and project/use intensity.

APPENDIX B: Lek Buffer-Distances (Evaluating Impacts on Leks) Chapter Page Paragraph / Line / Figure / Table Comment 1 1-9 Table 1-3, Row 1 NACO made previous comments regarding lek buffers under Table 1-3, Row 1, Modifying Lek Buffers, which are incorporated by reference here. The comments below must be considered in the context of our previously made comments. See County Needs Attachment Appendix B B-1 3-4 Revise to read "…appropriate (e.g. state wildlife agency plans, local agency plans, and local information) …" Appendix B B-1 4-7 Revise to read "…using the general lek buffer-distances and guidance identified in the USGS…" Appendix B B-1 8 Change "basis" to "guideline" Appendix B B-1 14 Revise to read "low structures (e.g., fences, rangeland structures) within 1.2 miles of leks in flat or rolling terrain;" As previously noted, a universally applicable 1.2-mile buffer zone for fences and rangeland structures is not supported or recommended by the USGS report. The USGS report notes this 1.2 mi buffer in flat or rolling terrain only. Appendix B B-1 15-16 It is important to clarify what is meant by "surface disturbance." This does not include diffuse activities and permitted livestock grazing. Also, it should be clear that encroaching or infilling PJ removal (which is altering or removing "natural" vegetation) is not surface disturbance. Appendix B B-1 19-21 Revise to read "Justifiable departures to decrease or increase from these distances from the lek where impacts are anticipated, based on local information and data, best available science, landscape features, co-location with existing infrastructure or disturbance creating no net increase in impact, and other existing protections or factors reducing visibility and audibility (e.g., land use allocations, state regulations) may be appropriate." See County Needs Attachment Appendix B B-2 1-5 Revise to read … "landscape features, co-location with existing infrastructure or disturbance creating no net increase in impact, and other existing protections or factors reducing visibility and audibility (e.g., land use allocations, state regulations)…" Appendix B B-2 18-19 Revise to read "…GHMA, and with input from the state wildlife agency and appropriate local agencies." See County Needs Attachment.

BLM should eliminate the lek buffer zone restrictions outlined in Appendix B because they are premised on landscape scale land use policies that this administration and Congress have revoked. WMC recognizes that it may be appropriate to limit or even preclude certain activities near active leks during the active breeding season. However, the 2018 DEIS applies these restrictions throughout the year. Once the lek breeding season is over for the year, the lek buffer zone restrictions should not apply. Consistent with the provisions for modifying habitat management area designations based on field verified habitat data, implementing the lek buffer zone restrictions should require current lek occupation data, which should be defined as best available science in the context of imposing a lek buffer zone. Other site characteristics including landscape features (e.g., topography) which shield a project from a nearby lek and lessen or even eliminate any impacts from the proposed land use activities must be considered in the lek buffer zone determination. At many sites the resulting buffer zone could be much smaller than the current one-size-fits all approach.

Along with compensatory mitigation, lek buffers are included in the category of, one-size-fits-all measures premised on landscape-scale land use planning concepts. Lek buffer zone restrictions should be developed based on field-verified data on a case by case basis that takes topography into account. Coeur understands that it may be appropriate to limit or even restrict certain activities near active leks during the active breeding season; however, the 2018 RMP DEIS states that these restrictions will be year-round. Once it has been determined that the lek breeding season is over for the year, lek buffer zone restrictions should not apply. FLPMA Section 302(b) authorizes such unavoidable impacts for mining activities pursuant to the U.S. Mining Law; therefore, BLM is not authorized to prohibit such activities or to require mitigation.

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provide proposed language on this same issue in our review of Appendix B below. See County Needs Attachment 1 1-9

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C.4.11 Required Design Features

Required Design Features Worksheets Although the DEIS states throughout Chapter 4 that no allocation decisions are tied to OHMA (see, for example, DEIS at 4-19), the Required Design Features ("RDFs") worksheets show that they are applicable to OHMA. This needs to be clarified. Additionally, many of the RDFs are not applicable to non-discretionary activities pursuant to the U.S. Mining Law and the 43 CFR 3809 regulations, which also needs to be clarified. Finally, some of the locatable minerals RDFs are impractical and as currently written would substantially interfere with claimants' rights under the Mining Law. For example, RDF LOC 3 stipulates "restrict pit or impoundment construction to reduce or eliminate augmenting threats from West Nile Virus". Pits and impoundments (i.e., tailings impoundments) are necessary for mining to occur and cannot be eliminated. Similarly, the requirement to cover pits "regardless of size" with netting in the RDFs for locatable minerals (RDF LOC 7) needs to be clarified to pertain to small pits like drilling sumps and not to open pit mines or pit lakes in open pit mines. It is obviously impractical to cover a large pit with netting.

Although the DEIS states throughout Chapter 4 that no allocation decisions are tied to OHMA (see, for example, DEIS at 4-19), the Required Design Features ("RDFs") worksheets show that they are applicable to OHMA. This needs to be clarified. Additionally, many of the RDFs are not applicable to non-discretionary activities pursuant to the U.S. Mining Law and the 43 CFR 3809 regulations, which also needs to be clarified. Finally, some of the locatable minerals RDFs are impractical and as currently

written would substantially interfere with claimants' rights under the Mining Law. For example, RDF LOC 3 stipulates "restrict pit or impoundment construction to reduce or eliminate augmenting threats from West Nile Virus". Pits and impoundments (i.e., tailings impoundments) are necessary for mining to occur and cannot be eliminated. Similarly, the requirement to cover pits "regardless of size" with netting in the RDFs for locatable minerals (RDF LOC 7) needs to be clarified to pertain to small pits like drilling sumps and not to open pit mines or pit lakes in open pit mines. It is obviously impractical to cover a large pit with netting.

3.5 Application of Required Design Features WREC has recent experience working with the Required Design Features Worksheet included in Appendix C of the RMPA/EIS. Note that the actual Required Design Features (RDFs) did not change from the current Plan to the worksheet in Appendix C, just the way in which they are presented. This worksheet puts the responsibility of identifying applicable RDFs on a project applicant, rather than the BLM field office issuing the permit. WREC believes it should not be the responsibility of the applicant to identify appropriate RDFs. Rather it should be the BLM field office personnel who examine a project and select appropriate RDFs, as opposed to the current practice where all RDFs are required unless the applicant works through numerous bureaucratic hoops to have them removed.

Clarify That Management Restrictions Are Not Applicable to Notices and Mining Plans Under 43 C.F.R. Subpart 3809 LNC supports and agrees with the proposed clarifications in the land use plan. DEIS at Table ES-3. In that regard, we are particularly interested in the Required Design Features worksheet included as Appendix C. However, confusion remains because neither the revised plan nor the worksheet explicitly exempt mining notices and plans from the General RDF's. We recommend that the plan include an explicit provision that the RDF's are not applicable to notices and plans under 43 C.F.R. Subpart 3809 and that similar language be on the Required Design Features Worksheet. At a minimum, the plan should be modified to include language to clarify that design features are required "where practicable" and may not be applied in a way that would prevent mineral development, particularly development of critical minerals.

As noted above in the discussion on the need to revisit uniform lek buffers, the preexisting regulations at 43 Code of Federal Regulations Subpart 3809 cannot be ignored as a regulatory framework to guide project management on Federal lands that play a role in GRSG conservation. In the Nevada LUPA, BLM must acknowledge that in proscribing RDFs, such design features are applicable to BLM decisions under 43 C.F.R. Subpart 3809 only to the extent practicable and may not be imposed to deny approval of a notice or plan of operations under those regulations.

We recommend that the Final EIS disclose the metrics that would be used in RDF determination for the types of actions likely to be proposed in PHMA and GHMA designated lands.

Rural utilities do not have the man-power and simply cannot afford the added cost of retrofitting all distribution poles with perch deterrents without passing those costs on to the members in the cooperative. Additionally, the increased maintenance required for perch deterrents will increase the operation and maintenance costs, and time spent in the field which would lead to increased disturbance on greater sage-grouse from maintenance and inspection crews.

This worksheet puts the responsibility of identifying applicable RDFs on a project applicant, rather than the BLM field office issuing the permit. LCPD believes it should not be the responsibility of the applicant

to identify appropriate RDFs. Rather it should be the BLM field office personnel who examine a project and select appropriate RDFs.

Consider updating the fence standards based on the NRCS fence standards and specifications, Code 382, maintaining that the fences creating legal "boundaries" continue to follow NRS 569.431; and requiring fence markers around sumps or meadows.

RDF GEN 10. This requirement should be deleted in the RMPA. We find nowhere in either the 2015 RMPA or the 2018 DRMPA where the motion of livestock windmills or pump jacks have been analyzed, nor any science that would support a provision to "minimize" their impacts on sage-grouse habitat. These small structures are entirely unlike power-generating windmills or the large pump jacks used in the gas and oil industry. 34. RDF GEN 20. The phrase "and fences" should be removed from the wording of this RDF. Fences are not considered "tall structures", and there is no supporting evidence that fences create additional perches for avian predators over and above the background setting of the DRMPA. Further, BLM has in the past construed "minimum number" to mean "no number", and such an interpretation should be avoided. This RDF should be reworded to state: "To reduce perching in GRSG habitat, construction of vertical facilities (excluding fences) will be constructed following a 'avoid, minimize, mitigate' hierarchy policy. Mitigate is defined at 40 CFR 1508.20"

APPENDIX C: Required Design Features Worksheet Chapter Page Paragraph / Line / Figure / Table Comment Appendix C All All Revise the first checkbox under every single "If RDF not applied, select reason" to read "A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to ground truthing, site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable." Appendix C All All Revise the second checkbox under every single "If RDF not applied, select reason" to read "An alternative RDF or appropriate mitigation is determined to provide equal or better protection for GRSG or its habitat." Appendix C All All Please revise the definition to read "Existing routes. Existing routes are defined as those routes on the ground that clearly show prior use to the extent that a travel path is clearly visible." There are many RDFs related to "existing roads", "existing routes", or "new roads." This creates issues due to the definition of "existing routes" in the Glossary. The definition is problematic and not based on realities on the ground. NACO strongly disagrees with the definition. Many existing routes are used more heavily in different seasons. Additionally, many routes that are mechanically maintained (i.e., motor grader) do not have maintenance occur often enough to keep vegetation from establishing within the route, including centerlines, shoulders and drainages. Many of these routes are mapped on official federal agency maps and publicly available commercial products. See County Needs Attachment. Appendix C C-3 RDF Gen 15 Revise to "When interim reclamation is required, irrigate site, in accordance with state water law, to establish seedlings more quickly if the site requires it." Appendix C C-4 RDF Gen 17 Revise to "Reclaim disturbed areas at final reclamation to the pre-disturbance landforms, as feasible, and informed by desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state." Appendix C C-5 RDF Gen 22 Revise to "Load and unload all equipment on existing roads or disturbed areas (i.e., laydown areas and turnouts) to minimize additional disturbance to vegetation and soil." Appendix C C-6 RDF LR-LUA 1 Revise to "Where new ROWs associated with valid existing rights are required, co-locate new ROWs within or immediately adjacent to existing ROWs or where it best minimizes impacts in GRSG habitat. Use existing roads or realignments of existing roads to access valid existing rights that are not yet developed Appendix C C-6 RDF LR-LUA 2

Revise to "Do not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document or, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts." Appendix C C-7 RDF WFM 2 Revise to "Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting and maintaining perennial vegetation (e.g., green-strips) or chemical or mechanical fallow (e.g., brown-strips), where appropriate, paralleling road rights-of-way."

Appendix C C-8 RDF Lease FM 4 Revise to "Ensure habitat restoration meets desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state."

Appendix C C-9 RDF Lease FM 6 Revise to "Reclaim disturbed areas at final reclamation to the pre-disturbance landforms, as feasible, and informed by desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state." Appendix C C-10 RDF Lease FM 11 Revise to "Co-locate or cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement." Appendix C C-12 RDF LOC 2 Revise to "Co-locate or cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement." Appendix C C-14 RDF CTTM 1 Revise to "Rehabilitate roads, primitive roads, and trails not designated in approved travel management plans. This would not include roads with determined or undetermined claims of pre-FLPMA right of way." Appendix C C-14 RDF CTTM 2 Revise to "Reclaim closed duplicate roads by restoring original landform, as feasible, and establishing desired vegetation in GRSG habitat informed by desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state. This would not include roads with determined or undetermined claims of pre-FLPMA right of way."

Although the DEIS states throughout Chapter 4 that no allocation decisions are tied to OHMA (see, for example, DEIS at 4-19), the Required Design Features ("RDFs") worksheets show that they are applicable to OHMA. This needs to be clarified.

Additionally, many of the RDFs are not applicable to non-discretionary activities pursuant to the U.S. Mining Law and the 43 CFR 3809 regulations, which also needs to be clarified. Finally, some of the locatable minerals RDFs are impractical and as currently written would substantially interfere with claimants' rights under the Mining Law.

For example, RDF LOC 3 stipulates "restrict pit or impoundment construction to reduce or eliminate augmenting threats from West Nile Virus". Pits and impoundments (i.e., tailings impoundments) are necessary for mining to occur and cannot be eliminated.

Similarly, the requirement to cover pits "regardless of size" with netting in the RDFs for locatable minerals (RDF LOC 7) needs to be clarified to pertain to small pits like drilling sumps and not to open pit mines or pit lakes in open pit mines. It is obviously impractical to cover a large pit with netting.

APPENDIX C: Required Design Features Worksheet Chapter Page Paragraph / Line / Figure / Table Comment Appendix C All All Revise the first checkbox under every single "If RDF not applied, select reason" to read "A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to ground truthing, site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable." Appendix C All All Revise the second checkbox under every single "If RDF not applied, select reason" to read "An alternative RDF or appropriate mitigation is determined to provide equal or better protection for GRSG or its habitat." Appendix C All All Please revise the definition to read "Existing routes. Existing routes are defined as those routes on the ground that clearly show prior use to the extent that a travel path is clearly visible." There are many RDFs related to "existing roads", "existing routes", or "new roads." This creates issues due to the definition of "existing routes" in the Glossary. The definition is problematic and not based on realities on the ground; we strongly disagree with the definition. Many existing routes are used more heavily in different seasons. Additionally, many routes that are mechanically maintained (i.e., motor grader) do not have maintenance occur often enough to keep vegetation from establishing within the route, including centerlines, shoulders and drainages. Many of these routes are mapped on official federal agency maps and publically available commercial products. See County Needs Attachment Appendix C C-3 RDF Gen 15 Revise to "When interim reclamation is required, irrigate site, in accordance with state water law, to establish seedlings more quickly if the site requires it." Page 43 of 89 Appendix C C-4 RDF Gen 17 Revise to "Reclaim disturbed areas at final reclamation to the pre-disturbance landforms, as feasible, and informed by desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state." Appendix C C-5 RDF Gen 22 Revise to "Load and unload all equipment on existing roads or disturbed areas (i.e., laydown areas and turnouts) to minimize additional disturbance to vegetation and soil." Appendix C C-6 RDF LR-LUA 1 Revise to "Where new ROWs associated with valid existing rights are required, co-locate new ROWs within or immediately adjacent to existing ROWs or where it best minimizes impacts in GRSG habitat. Use existing roads or realignments of existing roads to access valid existing rights that are not yet developed. Appendix C C-6 RDF LR-LUA 2 Revise to "Do not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document or, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts." Appendix C C-7 RDF WFM 2 Revise to "Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting and maintaining perennial vegetation (e.g., green-strips) or chemical or mechanical fallow (e.g., brown-strips), where appropriate, paralleling road rights-of-way." Appendix C C-8 RDF Lease FM 4 Revise to "Ensure habitat restoration meets desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state." Appendix C C-9 RDF Lease FM 6 Revise to "Reclaim disturbed areas at final reclamation to the pre-disturbance landforms, as feasible, and informed by desired habitat conditions based on current ecological potential according to ESD, associated STM and existing ecological state." Appendix C C-10 RDF Lease FM 11 Revise to "Co-locate or cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement." Appendix C C-12 RDF LOC 2 Revise to "Co-locate or cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement." Appendix C C-14 RDF CTTM 1 Revise to "Rehabilitate roads, primitive roads, and trails not designated in approved travel management plans. This would not include

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C.4.12 Fire and Invasive Species

The DEIS often states that there has been and will likely continue to be fires that eliminate sage-grouse habitat, but the DEIS does not present updated information or analyses of the current the existing condition, as it should as required by NEPA.

The County would encourage the BLM to expedite the implementation of fuel breaks, other wildfire pre-suppression/hazard fuels reduction efforts, and post fire rehabilitation, particularly within Sage-grouse habitat.

Reduce manageable impacts in sage-grouse habitat. Some threats to sage-grouse are difficult to manage, such as wildfire and invasive species. The federal conservation strategy should compensate for those impacts by emphasizing management of land uses that we can control, such as improperly managed livestock grazing, which contributes to unnatural fire and the spread of invasive species.

greater attention needs to be given to the area of implementing adaptive management steps which consider the risk of levels of fuel loads and stress proactive on-the-ground management steps to apply pre-suppression action to reduce the levels of massive wildfire destruction.

The Draft EIS acknowledges that wildfire destruction has exceeded restored habitat, yet the need for attention in management changes are ignored in this Draft EIS, alluding to "two programmatic EISs that are being prepared for implementing activities."

Elements (like Table 2.2) incorporated into current BLM land management plans need to be corrected with a balanced assessment of resource risk which recognizes fuel loads and results in pre-suppression fuel management activity to reduce the threats of habitat loss from wildfire. Changes in livestock grazing permits need to be incorporated that provide flexibility for using livestock grazing as a tool in pre-suppression fuel management, identified through a balanced assessment of resource conditions.

the BLM has still not provided sufficient funding for fire management, range improvement, reseeding and restoration after fires.

* Restore funding for fire management and weed control: Request that money coming into the BLM from grazing allotments, mining claim fees, oil, gas and geothermal leases, and other payments to the U.S. from states with proposed sage-grouse restrictions be used to improve the sagebrush habitat, including fire prevention, reseeding after fires and reclamation of fireweed areas.

Heavier cover for greater sagegrouse translates to higher fire fuel loads across the landscape. Substantial fuel loads make large-scale wildfires inevitable in many sagebrush communities. Repeat burns increase the likelihood that plant communities will cross a threshold and shift toward cheatgrass dominance, which in turn increases wildfire frequency, eliminating the ability of sagebrush communities to re-establish.

DRMP/EIS should describe the threat of catastrophic wildfires that bum very large areas and that have become common in the recent years. Large hot fires are directly correlated to the abundance of vegetation that accumulates when livestock grazing is prohibited.

EPA recommends that the Final EIS quantify the acreage that burned in each type of HMA and explain how, if at all, the impacts of fire were factored into the modified HMA designated boundaries. We also recommend that the Final EIS clarify whether the burned lands in the PHMA or GHMA would retain their existing designations or would no longer be designated as PHMA or GHMA. Issue #4: Restoration and Rehabilitation not adequately assessed and May Not Reflect Achievable Conditions. The LUPAs have significant flaws in assessing restoration and rehabilitation potential and impacts outside of fire rehabilitation. The documents do not address the need to prioritize areas for restoration where natural disturbance such as fire has occurred. They also do not address the need to evaluate unintended negative consequences, as well as the cost and the likelihood of success in restoration projects. The documents also do not discuss areas that have crossed an ecological threshold. Specifically, the GRSG LUPA in (at least) Nevada includes the following Management Directions that demonstrate these flaws / consequences: Nevada - MD VEG 6: Manage for establishment of sagebrush in unmaintained nonnative seedings (e.g., crested wheatgrass seedings) in or next to GRSG habitat to mete habitat objectives (Table 2-2).Nevada - MD LG 20: In PHMA and GHMA, rest areas that have received vegetative treatments from livestock grazing until resource monitoring data verifies the treatment objectives are being met and an appropriate grazing regime has been developed. Any livestock grazing temporary suspended use or other management changes per 43 CFR, Part 4110.3-2a for the purpose of a vegetation treatment will be done through the grazing decision, prior to treatment. Nevada - MD LG 22: After grazing rest associated with vegetation treatments in PHMAs and GHMAs, monitor annually for a minimum of 5 years to ensure project objectives are being maintained. Issue #4, Recommendation 4: Priorities for re-establishment of sagebrush cover should be re-evaluated with "recently burned native areas" receiving first consideration. The post burn probability of expanding the range of invasive species or noxious weeds makes fire rehabilitation efforts a top priority. Extreme caution must be exercised with any proposal designed to convert nonnative perennial grasslands (especially those within lower elevation Wyoming big sagebrush sites) to a sagebrush dominated habitat with native understory. State and transition models should be utilized when setting project goals. Under current technology and funding, confidence in any conversion attempt is lacking, and any commitment by this planning process to do so is unrealistic; resulting to unachievable expectations. Issue #4, Recommendation 5: Management must be allowed the flexibility to manage authorizations based on realistic time frames. Specifically, for example, recent research by Lance Vermeire, USDA-Agricultural Research Service, who is an ecologist, "found grazing within a year after a wildfire doesn't harm grass and can provide just as much forage as sites that haven't burned." See https://agresearchmag.ars.usda.gov/2017/sep/grasses/ (last checked on 12/1/2017). In addition, management must be allowed the flexibility to authorize grazing when evaluations determine objectives of the project will not be met. Language stating objectives must be met before livestock return must be removed from any and all documents. Issue 4: DEIS Comment 4, 5: This recommendation is omitted for any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

Other issues that need to be address for the benefit of the sage grouse are predator control and invasive weeds. We are concerned with the amount of fox tail that is starting to invade the meadow on the north end where the general public access road is. If this patch is not brought under control, it will

eventually take over a large portion of the meadow and reduce the brood rearing habitat that is needed for the sage grouse, livestock and wildlife. Some mechanical means needs to be used to bring the fox tail under control or eradicate it. Also the number of ravens need to be addressed to reduce their impact on nesting areas.

We also hope that the BLM is opposed to the current Washoe County proposal to designate the majority of the Bitner allotment as Wilderness. The wilderness designation will add multiple layers of restrictions that will not benefit the sage grouse. Mechanically controlling invasive weeds and fire suppression as well as using mechanical means to maintain fences etc will become very difficult or not allowed. Maintaining water sources or developing new ones with mechanical means will be more restricted. Many of the water reservoirs need to be cleaned out so storage capacity is increased so all species have access to more stable water sources.

The County would like to remind the public land management agencies that wildfire and altered fire behavior / fire cycles due to annual invasive species such as cheatgrass remain the top threat to Sage-grouse in Nevada. This point has never been clearer than on the heels of the Martin Fire that burned over 435,000 acres in five days (223,000 acres on July 7 alone), including 433,000+ acres of mapped Sage-grouse habitat, much of which is in Humboldt County. While the fire was driven by a combination of topography and severe fire conditions, extremely high fine fuel loads (reported via Inciweb on July 7 as over 200% of normal cheatgrass) contributed to the rapid fire spread and ineffectiveness of traditional fire suppression techniques. This highlights the Count'/s concern of over-regulation of livestock grazing and a continual reduction in grazing (as measured in Animal Unit Months, AUMs) since the 1970s, resulting in build-up of fine fuels, particularly in years with above average winter and spring precipitation. The inability of the BLM to respond in real-time to such fuel loads, and provide added flexibility and effectiveness for the most cost-effective pre-suppression tool (managed grazing) continues to concern the County. As such, the County urges the BLM to incorporate new management actions that allow increased grazing of fine fuels, particularly when fuel loading is high, as a means of wildfire pre-suppression. The County supports the implementation of any and all tools (Programmatic EIS Analysis, Allotment Management Plans, Temporary Non-Renewable Grazing Authorizations, Outcome Based Grazing, etc.) to ensure more effective use of grazing as a fuels reduction method. Until this happens, the County foresees similar outcomes to the Martin Fire. To that end, the County has attached an Article in Press titled Viewpoint: An Alternative Management Paradigm for Plant Communities Affected by Invasive Annual Grass in the Intermountain West. This article was developed by some of the most respected and experienced Range Management Professionals in the Great Basin, and the County fully supports their proposed 'Fuels Management Approach'.

* The County would have preferred to see more of an emphasis on fire management (fuels reduction, suppression, use of local fire fighting resources, and post fire rehabilitation) but appreciates and supports ongoing efforts to address fire through ongoing Programmatic EIS processes.

Successful protection of habitat cannot be achieved without meeting the threat of wildfire head on and using all tools in the toolbox. These tools should first include timely/managed grazing and this EIS should evaluate the use of grazing outside of current permits to provide NEPA analysis for land managers to tier to (something we have heard consistently over the last two years as a reason grazing couldn't be used to remove hazardous fuel loading).

The LUPA fails to recognize that managed livestock grazing represents an important and cost effective tool to achieve desired sage-grouse habitat conditions and to reduce wildfires. The livestock grazing restrictions in the LUPA will cause environmental harm because they will increase the volume of highly flammable non-native invasive annual grasses and inevitably lead to more wildfires. The livestock grazing restrictions in the LUPA conflict with Section 6.21 of the Eureka Master Plan which specifically states: "… Managed grazing is beneficial in preventing excessive damage to plants by wildfire and prohibition of grazing prior to a fire results in unnecessary damage to the plants." The increased fuels that will result from the economically burdensome and technically ill-advised livestock grazing restrictions in the LUPA will place a burden upon our fire district and very likely result in destruction of critical GRSG habitat. The LUPA will also decrease the level of active management currently provided by ranchers that benefit GRSG. When permitted to have livestock on the range, ranchers provide a constant presence to maintain water developments used by wildlife, provide first response to fires, keep a watchful eye, and provide a timely response to situations that may be detrimental to GRSG habitat. Eureka County has led numerous efforts to improve and conserve GRSG habitat by taking proactive measures to address pinyon-juniper (P-J) encroachment, which is a known threat to GRSG habitat. Eureka County approached BLM in 2011 with a proposal to hand thin P-J around selected springs on BLM-administered land. Unfortunately, Eureka County is still waiting for BLM to approve this habitat improvement project. Eureka County has proceeded with concerted actions to remove P-J from thousands of acres of private lands that have habitat characteristics that would benefit from P-J removal. The County successfully built relationships and gained approvals from private landowners and identified funding, including grants, to hire hand-crews to selectively remove P-J from over 5,000 acres on private land in GRSG habitat on Roberts Mountain, the Diamond Range, the Monitor Range, and the Sulphur Springs Range in southern Eureka County at a cost over $300,000, and have additional funds committed for continued P-J removal projects. The LUPA restrictions, including but not limited to the lek buffer zones, disturbance caps, seasonal travel restrictions, road closures, and noise limits, will interfere with these types of conservation projects, making private landowners less able and willing to work on cooperative conservation efforts, which will frustrate the goal of conserving and enhancing GRSG habitat. Eureka County has also spearheaded projects to rehabilitate and restore agricultural lands in and adjacent to GRSG habitat because invasive weeds increase wildfire risks. Eureka County has a substantial noxious and invasive weed treatment program that treats over 1,000 acres of noxious and invasive weeds per year at a cost of $60,000 to $100,000 per year. The 2015 ARMPA travel restrictions limits Eureka County's ability to access weed infested roads in the spring, which is the optimal treatment time. The 2015 ARMPA threatens the viability of this important fire reduction and habitat conservation program, which is funded with taxpayer monies collected mainly from ranchers and farmers. These tax revenues from ranching and farming are expected to decline as a result of the land use restrictions. Eureka County has constructed, maintained, and repaired wildlife water guzzlers and wildlife escape ramps that benefit GRSG and other wildlife species. The LUPA will impair the ability to pursue and implement wildlife water developments and habitat projects approved on BLM-managed land.

We ask that BLM immediately authorize targeted and managed grazing and brush thinning or removal to reduce fuel loads as an emergency measure to address wildfire risks

"Wild fire and the period of time for recovery from fires has become a regulatory issue in Eureka County that has caused unreasonable economic hardship to Eureka County livestock producers. Properly managed grazing provides a substantial advantage for native plant recovery following fire. Prohibition of grazing following wildfire is not necessary for the recovery of rangeland vegetation.

Managed grazing is beneficial in preventing excessive damage to plants by wildfire and prohibition of grazing prior to a fire results in unnecessary damage to the plants" (p. 6-8). o The DEIS includes provision to defer grazing after wildfires in all cases and does not fully recognized properly managed grazing as the best and primary tool to manage fuel loads before and immediately after fires. This must be included. Specifically, there needs to be inclusion of a methodology to allow for and streamline Temporary Non-Renewable (TNR) allocation of forage for fuels reduction in general and specifically including measures to allow for targeted cheatgrass control through TNR.

"Develop prescribed fire and wildfire management plans to re-establish historic fire frequencies for appropriate vegetation types and include in such plans livestock grazing techniques as a tool for fire fuel management related to both wildfires and prescribed fires" (p. 6-10). o This is a major component missing from the DEIS. The condition of much of the Great Basin rangelands and coincident GRSG habitat is degraded due to a fire regime that is not conducive to health rangelands and GRSG habitats. The DEIS must develop strong measures to return fire to the landscape in a managed way, where appropriate, or Page 59 of 89 use other techniques, primarily livestock grazing, to mimic fire and it's positive historic influences on the diverse and varietal needs of GRSG. The DEIS speaks to "limiting human influence on intact GRSG habitats" especially where cheatgrass is present. Unfortunately, even in areas where cheatgrass appears to be absent, a bioassay of the soils would show that there is, in fact, a seedbank of cheatgrass almost ubiquitously (see research by USDA-ARS (Charlie Clements) in Nevada regarding this matter). Protecting these areas from livestock use or other use with the excuse that they will allow "establishment" of cheatgrass is dangerous and short-sighted. These protections will create large, catastrophic fires that will bear the evidence of cheatgrass nonetheless. Regarding wildfire management, there should instead be a focus on increasing man's influence in these ecosystems to allow for active, progressive, adaptive management. The decline in GRSG is coincident with the increase of regulatory schemes and bureaucratic hoops that must be overcome to do anything on the ground. This too has resulted in increases of extent and cycle of wildfires. Man's influence has shaped where we are today and man's influence must be focused, strategic, and targeted to keep managing these lands for GRSG habitat and current and future generations. See great work by the USDA-ARS Research Station in Dubois, Idaho where active grazing management and prescribed burning to mimic the historic fire regime has created an increase in GRSG when neighboring BLM land has continued to see a decline in GRSG ("A Home on the Range", Agricultural Research, November/December 2006).

While the DEIS acknowledges pinyon-juniper (PJ) encroachment and speaks to vegetation management of these issues, there is limited and general focus on the need to also address sagebrush and other shrub encroachment (such is rabbitbrush into meadows) and senescence (such as single age and decadent stands of sagebrush). If ESDs are followed, the areas, density, and cover of brush would be able to be targeted to approach ecological potential. Many of the vegetation/habitat objectives focus on values of sagebrush cover without consideration of site potential and conditions (state). Further, there is no effort in the DEIS to address utilization of Page 60 of 89 biomass from PJ as a means to incentive treatments and return dollars to the economy. Please include.

As such, the Board urges the BLM to incorporate new management actions that allow increased grazing of fine fuels, particularly when fuel loading is high, as a means of wildfire presuppression.

Desirable non-native species that are more readily available, more cost effective, more competitive with non-native annual grass species (particularly medusahead and cheatgrass) and provide a similar ecological functionality should also be encouraged for use.

C.4.13 Outcome Based Grazing

Fuel loads, particularly cheaturass, are high in the County due to two consecutive springs of above-average precipitation. These fuel loads carried multiple large wildfires in the County last year and have only exacerbated the accelerated cheatgrass-fire cycle. As such, anything the BLM can do to allow additional grazing that targets reduction of such excess fuel is highly encouraged, particularly around potential ignitions sources (i.e. Highway 50 and the Fallon Training Range Complex Bravo bombing ranges).

Moving forward, the agencies MUSt recognize the highly positive effects of livestock grazing on a healthy ecosystem. They must amend seasons of use, amount of use to correspond to conditions on the ground, not a rule book or outdated AOI and ten year agreement.

C.4.14 Land Health Assessments

1-Range Improvements and Supplemental Feeding Range improvements and supplemental feeding are critically important for achieving standards of rangeland health and for herd health. The LUPAs apply a negative focus on range improvements, including but not limited to water developments and fencing. Specifically, the GRSG LUPAs in (at least) Idaho, Nevada, Utah, and Oregon include the following Management Directions, and Management Actions, which demonstrate these flaws / consequences: MD LG 19: In PHMAs and GHMAs, remove livestock ponds built in perennial channels that are negatively impacting riparian habitats, either directly or indirectly, unless riparian access is able to be controlled and negative impacts effectively mitigated (e.g.; water gap fence to pond), and don not permit new ones to be built in these areas subject to valid existing rights. Prior to pond removal, offsite watering options will be examined and considered. MD LG 13: For range improvement projects, review Objective SSS4 and apply MDs SSS1 through SSS 4 when reviewing and analyzing projects and activities proposed in GRSG habitat. MD LG 16: Authorize new water developments for diversion from spring or seep source, in accordance with state water law and subject to valid existing rights when PHMAs and GHMAs will benefit from or not be negatively impacted by the new development. This includes developing new water sources for livestock as part of a grazing management plan to improve GRSG habitat. MD LG 15: in accordance with state water law and subject to valid existing rights, remove or modify water developments that are negatively impacting GRSG habitats. MD LG 17: Modify water development projects to ensure riparian habitats in PHMAs and GHMAs are being maintained or improved in compliance with valid existing right sand in accordance with state water law. MD LG 18: Locate salting and supplemental feeding locations, temporary or mobile watering, and new handling facilities (e.g., corrals and chutes) at least 1 mile from riparian areas, springs, and meadows. The distance can be greater based on site-specific conditions. MD LG 14: Build or modify livestock exclosures so that they are large enough to provide hiding cover to GRSG and other wildlife and to reduce the possibility of wildlife collisions with fences (Christiansen 2009; Stevens 2011; NRCS 2012).

2- Issue #5, Recommendation 12: Any decision from this process would be amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180.

3- See Issue #2. Issue 5: DEIS Comment 12: This recommendation is omitted from any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation. Issue #5, Recommendation 13: The LUPAs fail to recognize that many range improvements are associated with water rights owned or held by the permittee. LUPA needs to identify that existing rights will not be impaired or taken. Issue 5: DEIS Comment 13: This recommendation is omitted for any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

4- Issue #5, Recommendation 14: Range improvements should not be prohibited per se in any GRSG habitat. Range improvements are a necessary range management tool. Issue 5: DEIS Comment 14: The DEIS, Appendix B, at page B-2, seems to address this issue by stating that: "If it is not possible to avoid or minimize impacts by relocating the project outside of the identified lek buffer-distance(s), the BLM may approve the project if: … Range improvements do not impact Greater Sage-Grouse, or range improvements provide a conservation benefit to Greater Sage-Grouse such as fences for protecting important seasonal habitats". While this may be a step in the right direction, it still spins range improvements as being contrary to sage grouse management in lek areas. It is common knowledge and occurrences that leks exist and/or leks are established in water development areas. Based thereon, it is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

5- Issue #5, Recommendation 15: As previously discussed in Issue #5, the LUPAs elevate livestock grazing and related range improvements to a priority threat. Complete removal of this focus must occur, but at a minimum all of the language above can modified with one management direction applied to all states. Any modified management direction should ensure that range improvements remain within the suite of actions to be considered to achieve applicable Standards and Objective, as is already prescribed in 43 C.F.R. 4180.2(c). Issue 5: DEIS Comment 15: This recommendation is omitted for any discussion in the DEIS. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

C.4.15 Alternatives

Please fully implement the current science-based sage-grouse plans.

C.4.16 New Alternative

Connect sage-grouse habitats. The federal government developed fifteen plans covering the sage-grouse's eleven-state range, but failed to stitch them together into a matrix that can provide for the species across federal jurisdictions and state boundaries. It is essential that these various plans work together and with the federal plan.

Going beyond the identified Preferred Alternative, we maintain that the land management plans that were adopted in 2015, need to be totally replaced using the Nevada Greater Sage Grouse Conservation Plan.

Alternatives: While I strongly support the BLM's implementation of the 2015 GRSG conservation plans before any whole scale changes are proposed, including those in the draft EIS, I am concerned that the plans, especially if the proposed amendments are adopted, will not be effective in dealing with

catastrophic losses of GRSG habitat in Nevada and Eastern California by invasive species and massive fires. One fire in Nevada can destroy as many acres of GRSG habitat as acres which are conserved or protected or restored for GRSG through BLM management actions and habitat projects in any one year. The Martin Fire is the largest single fire that has burned in Nevada. From a July 17, 2018 report of the Nevada Sagebrush Ecosystem Council, http://sagebrusheco.nv.gov/uploadedFiles/sagebrusheconvgov/content/Meetings/2018/Martin%20Fire.pdf we learned that as of this date, the Martin Fire had burned 691 square miles or 435,474 acres or 6% of Nevada. 357,165 acres of PHMA, 29,758 acres of GHMA and 46,377 acres of OHMA were destroyed. 47 GRSG leks, including 29 active leks were burned. The draft EIS totally fails to address either catastrophic habitat losses nor proposes any effective way to address these threats. A recent update of the GAP report by the Western Fish & Wildlife Agencies (WAFWA) reported that public land managers are losing a battle against invasive plant species and wildfires in sagebrush habitats in the US West: https://www.usnews.com/news/best-states/idaho/articles/2018-05-24/officialsefforts-failing-to-save-us-west-sagebrush-land. The report documents that invasive plants on nearly 160,000 square miles of public and private lands in the West have reached enormous levels and are spreading. WAFWA said that the top problem identified in the report is the limited ability at all levels of government to prevent invasive plants such as fire-prone cheatgrass from spreading and displacing native plants. "There is widespread recognition that invasive annual grasses and wildlife fire are the most crucial threats to the sagebrush ecosystem, yet invasive annual grass management is not funded at a level to be effective in breaking the invasive annual grass/fire cycle," the report said. Again, the draft EIS does not address these threats of catastrophic GRSG habitat losses. My suggestion for an alternative in the draft EIS for Nevada and Eastern California, if the BLM decides to continue this process, is a maximum GRSG protection alternative with a pledge by the BLM to restore as much GRSG habitat lost to wildfires or other events on an annual basis. This would require effectively funding the fight to control invasive plants to break the invasive plants/wildfire cycle in Nevada and the West.

C.4.17 Preferred Alternative

We support the Management Alignment Alternative for modifying habitat management areas. The Management Alignment Alternative also allows the Resource Management Plan maps to be updated when updates are approved by the Nevada SEC for the Nevada Plan. This is essential for consistent planning and coordination between state, federal, and private partners.

The NvMA advocates for the inclusion of state and local perspectives in land use planning and decision making whenever possible. The preferred alternative should be as inclusive as possible to allow for this input.

WEX appreciates the BLM's approach in the Management Alignment Alternative that appears to promote and require use of the best available information to create proper designation of any actual habitat based on that which will benefit the species, where that information must be based on ground-truthing making clear that the landscape level mapping is solely for purposes of generally designating a starting point of what is believed to be habitat - subject to site-specific and best available science. The Management Alignment approach to consider site specific information and also honor valid existing rights and consider existence authorized uses and disturbance also is legally appropriate and critical.

WEX strongly supports the approach under the Management Alignment Alternative to consider the importance of involvement of all stakeholders at the state and local level to develop specific strategies

or actions necessary to achieve conservation objectives. This critical component was totally absent and ignored in the 2015 process and would impermissibly continue under the No Action alternative. WEX appreciates the proposed consideration of greater coordination with county plans which contain conservation measures, while still accounting for necessary mineral exploration and fiscal health of the communities. Namely, WEX's investment-backed expectations are directly impacted by Elko County's conservation plan and the Nevada plan, and the BLM must strive for coordination with those plans and properly address any inconsistencies.

The Alliance specifically supports BLM's adoption of the Management Alignment Alternative because of changes it makes to the following resource issues: * Habitat management area designations * Sagebrush focal area designations * Adaptive management * Mitigation strategy * Seasonal timing restrictions

The Alliance supports and urges BLM to adopt the Management Alignment Alternative. Under this alternative, the proposed revisions to the operative resource management plan amendments in Nevada bring GrSG conservation measures in closer alignment with Nevada's Greater Sage-Grouse Conservation Plan. Coordination with the Nevada Plan is consistent with Interior Secretarial Order 3353: Greater Sage-Grouse Conservation and Cooperation with Western States, and it acknowledges the breadth of the State of Nevada and collaborative stakeholder's efforts to study and work to protect GrSG.

Of equal importance and as adopted by BLM, in the preferred alternative, habitat assessments of a project site and its surrounding area must be conducted by qualified biologists to identify suitable, marginal, or unsuitable habitat at multiple scales. Only with this site-specific, on-the-ground review of the habitat conditions can BLM be in a position to make informed and scientific decisions on siting of wind energy development and transmission projects.

We support the MAA for the remaining issues and clarifications in the RMPA DEIS.

ES-4 ES-9 Table ES-4 No Action Alternative: See Sagebrush Focal Area Attachment Management Alignment Alternative: Paragraph 1: BLM will need to verify this, but NACO believes that Coates et al 2016 identifies BSU boundaries, and the State of Nevada through its Sagebrush Ecosystem Council established Habitat Management Areas / SMGAs (see above comment). Paragraph 3: In this alternative "net conservation gain" needs to be updated to be consistent with the State Plan definition. Paragraph 4: Revise to read "…metrics for tracking changes and mitigating impacts in habitat quality and quantity by providing equivalent number of functional habitat acres over time is…"

Consequently, BLM cannot select the No Action Alternative as the Preferred Alternative in the 2018 FEIS. Additionally, BLM cannot incorporate elements of the alternatives considered in detail in the 2015 FEIS that are based on landscape-scale management into the Preferred Alternative in the 2018 FEIS.

WMC remains concerned about the aspects of the Management Alignment Alternative that are based on the landscape-scale management and mitigation principles embraced in the following documents: * The National Technical Team ("NTT") Report; * The Conservation Objectives Team ("COT") Report; * The October 2014 SFA Memo from the U. S. Fish and Wildlife ("FWS") Director to the BLM Director and the U.S. Forest Service Chief; 4 * The September 2014 U.S. FWS Mitigation Framework; * The November 2014 USGS Lek Buffer Study; and * The September 2015 Crist et al USGS Open File Report. Because all of these documents were developed to implement the Obama Administration's landscape-

scale land use and mitigation policies, they are no longer consistent with current policy and the law as Congress clarified in its rejection of BLM's Planning 2.0 Rule. Consequently, BLM must eliminate any future reliance on the findings or recommendations in these documents. This is another compelling reason why the No Action Alternative, which uses these documents as a foundation, is not selectable. However, it also means that elements of the Management Alignment Alternative in the 2018 DEIS that are based on the above-listed documents must be eliminated from BLM's Preferred Alternative in the 2018 FEIS and the amended LUP. Specifically, the one-size-fits-all, landscape-scale land use restrictions based on the NTT Report such as uniform lek buffers, seasonal restrictions, noise restrictions, disturbance caps, and required design features need to be eliminated and replaced with project-specific conditions based on actual site habitat conditions.

C.4.18 Range of Alternatives

The No Action Alternative is Not Selectable The 2018 Final EIS ("FEIS") needs to articulate that the No Action Alternative is not selectable because it is premised on landscape-scale planning concepts that are no longer consistent with the Department of the Interior's ("DOI's") policies and that Congress rejected when it used the Congressional Review Act (5 U.S.C. §801 et seq. "CRA") to rescind BLM's Planning 2.0 Rule I Congress may use the CRA and an expedited joint resolution legislative process to overturn last minute regulations from the previous Administration. As one of the last rules promulgated during the Obama administration, BLM published the Resource Management Planning Rule (Planning 2.0 Rule) on December 12, 2016 (81 FR 89580). The rule became effective on January 1 1, 2017. BLM's Planning 2.0 Rule, which was developed after the 2015 LUPs, was a reverse-engineered, after-the-fact regulation designed to require BLM to use the landscape-scale land use planning principles that are the foundation of the 2015 GSG LUPs in all future resource management planning efforts. In overturning the Planning 2.0 Rule, Congress reaffirmed its intent that DOI must develop resource management plans like the GSG LUPs in compliance with the land management principles in the Federal Land Policy and Management Act of 1976 ("FLPMA"), 43 U.S.C. §§ 1701 et seq. FLPMA does not authorize the landscape-scale planning measures embraced in the Planning 2.0 Rule and the 2015 GSG LUPs. Because the CRA prohibits agencies from reinstating a similar rule through rulemaking, BLM must not replicate the now defunct policies in its Planning 2.0 Rule in the 2018 amended GSG LUPs. Congress has made it clear that FLPMA does not authorize landscape-scale management of public lands. Therefore, the GSG Land Use Plans ("LUPs") must not be based on landscape-scale management philosophies. The SFA designations, the net conservation gain mitigation standard, uniform lek buffer zones, disturbance and density caps, rigid adaptive management triggers, and travel restrictions in the No Action Alternative/2015 LUPs are landscape-scale management provisions that are unauthorized in light of Congress' revocation of the Planning 2.0 Rule, violate FLPMA, and are inconsistent with the following Secretarial and Executive Orders: Secretary Zinke's June 2017 Secretarial Order 3353 "Greater Sage-Grouse Conservation and Cooperation with Western States;" President Trump's March 2017 Energy Independence Executive Order (EO 13783); and Secretary Zinke's March 2017 Secretarial Order 3349 implementing EO 13783.

The 2018 FEIS should clearly explain that the No Action Alternative in the 2018 DEIS and the 2015 LUPs are not consistent with FLPMA and DOI policies. Consequently, BLM cannot select the No Action Alternative as the Preferred Alternative in the 2018 FEIS. Additionally, BLM cannot incorporate elements of the alternatives considered in detail in the 2015 FEIS that are based on landscape-scale management into the Preferred Alternative in the 2018 FEIS.

Perch Discouragers on Tall Structures GRSG-LR-SUA-O-013-Objective and GRSG-LR-SUA-ST-017-Standard, identified in the current Plan, call for the retrofit of tall structures currently located in nesting habitat, PHMA, GHMA, and SFA to be fitted with perch deterrents when issuing new authorizations or renewing existing authorizations. While the SFA designation would be eliminated under Alternative B of the RMPA/EIS, the Objective and Standard described here would not be altered. This is overly burdensome on rural utilities which have many miles of distribution power line in greater sage-grouse habitat. Rural utilities do not have the manpower and simply cannot afford the added cost of retrofitting all distribution poles with perch deterrents without passing those costs on to all members in the cooperative. Additionally, the increased maintenance required for perch deterrents will increase the operation and maintenance costs and time spent in the field which would lead to increased disturbance on greater sage-grouse from maintenance and inspection crews. WREC has previously worked with BLM to place perch deterrents in areas where they may be warranted. WREC recently agreed to stipulations requiring the placement of avian perch discouragers within 4.0 miles of an active lek and having a direct line of sight to that lek. This demonstrates that WREC is willing to work to increase protections for greater sage-grouse, but these efforts must be concentrated in locations where they will actually make a difference and the cost-benefit of applying perch deterrents makes sense.

Courts have required an SEIS when the proposed action differs "dramatically" from the alternatives described in the DEIS so that meaningful public comment on the proposed action 'vvas precluded, see California v. Block, 690 F,2d 753, 758 (9th Cir. 1982). Here, none of the DEIS alternatives utilized all or most of the key elements found in the Proposed Action, particularly the SFAs and lek-buffer distances as applied through the new Lek Buffer Study. Indeed, the Proposed Action amalgamated so many different elements that the Preferred Alternative could not have been fairly anticipated by reviewing the DEIS alternatives, thus "seriously diluting the relevance of public comment on the DEIS alternatives." California v. Block, 690 F.2d at 758. See also New Mexico ex rel. Richardson v. Bureau Q/Land Management, 565 F.3d 683, 707 (10th Cir. 2009) (new alternative proposing new locations of activities required an SEIS because it affected "environmental concerns in a different manner than previous analyses," even though the general nature of the alternatives impact resembled those already analyzed). This fatal enor is compounded through the heavy reliance on the Ashe Memo and the Lek Buffer Study both significant and material post-DEIS information- that formed key cornerstones to the Proposed Action. See PLUPA/FEIS at 2-2 (describing the need for SFAs, "In light of the landscape level approach to GRSG conservation provided through this planning effort and as defined by the characteristics set forth above, as well as additional considerations, including potential for impacts from climate change, fire and invasives, these areas have been identified as SFAs.") and justifying buffers through "The USGS report [which] states that 'various protection measures have been developed and implemented.. [which have] the ability (alone or in with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands.'", PLUPA/FEIS at Appendix B-2. Accordingly, the Agencies' justification that the PLUPA is a lawful "suite of management decisions that present a minor variation of the Preferred Alternative identified in the Draft LUPA/EIS5" FEIS at 2-6, fails both practically and as a matter of law.

The range of alternatives is insufficient. The Draft EIS only considers one alternative, the "Management Alignment Alternative", and refers to the 2015 Sage-grouse Plans as the "No Action Alternative." This does not meet BLM's obligations under NEPA. The range of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. See 40 C.F.R. §§ 1502.14(a) and

1508.25(c). NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme. Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989) (citations and emphasis omitted). "An agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action." Northwest Envtl Defense Center v. Bonneville Power Admin., 117 F.3d 1520, 1538 (9th Cir. 1997). An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally protective alternatives and mitigation measures. See, e.g., Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094,1122-1123 (9th Cir. 2002) (and cases cited therein). By only meaningfully considering one alternative and not considering alternatives that would be more environmentally protective, BLM has failed to consider a reasonable range of alternatives. 1. Alternatives are measured against purpose and need; BLM has not considered a reasonable range of alternatives in the Draft EIS based on the restated purpose and need. When developing an EIS, the "range of reasonable alternatives is measured against the 'Purpose and Need' section…." Cal. ex rel. Lockyer v. U.S. Dep't. of Agriculture, 459 F. Supp. 2d 874, 905 (N.D. Calif., 2006), aff'd, 2009 U.S. App. LEXIS 19219 (9th Cir. 2009). The statement of "purpose and need" is the basis upon "which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. §1502.13 and City of Carmel-by-the-Sea v. U.S. Dep't. of Transportation, 123 F.3d 1142, 1155 (9th Cir. 1997). Therefore, if the purpose and need of the 2018 Draft EIS for the Greater Sage-Grouse changes from the purpose and need for the 2015 EIS, then the range of alternatives must necessarily change as well. Even the 2018 Draft EIS recognizes that "BLM's purpose and need for this planning action helps define the scope of proposed alternative actions…" NV/CA Draft EIS at ES-2.

The No-Action Alternative in the Draft EIS is the baseline, not a real alternative. The 2018 Draft EIS for the Greater Sage-Grouse purports to compare two alternatives - the "No Action Alternative" versus the "Management Alignment Alternative." See NV/CA Draft EIS at 2-3. But the "'no action alternative generally does not satisfy the proposed action's purpose and need; its inclusion in the Environmental Impact Statement is required by NEPA as a basis for comparison.'" Lockyer at 905, quoting Ronald E. Bass, Albert I. Herson & Kenneth M. Bogdan, The NEPA Book: A Step-by-Step Guide on How to Comply with the National Environmental Policy Act, 95 (2d. ed. 2001). Because the No Action Alternative fails to satisfy the purpose and need of the 2018 Draft EIS, the Draft EIS proposes only one alternative: the Management Alignment Alternative. When there is only one alternative, it is not, by definition, an alternative at all. "[T]he agency must consider a range of alternatives that covers the full spectrum of possibilities." Sierra Club v. Watkins, 808 F. Supp. 852, 872 (D.D.C. 1991). By proposing the "Management Alignment Alternative" as the only option to the status quo, BLM has failed to "consider a range of alternatives that covers the full spectrum of possibilities." Id. at 872. 3. BLM must evaluate additional management alternatives. BLM must consider additional alternatives, including alternatives that are more environmentally protective than the Management Alignment Alternative. The purpose and need of the 2015 Sage-grouse Plans is to "conserve, enhance, and restore GRSG habitat by eliminating or minimizing threats to their habitat" (Rocky Mountain Record of Decision, p. 1-21), while the 2018 amendments are based on a purpose to "enhance cooperation with the states." BLM should consider an alternative that is explicitly focused on enhancing cooperation with the states while conserving, enhancing and restoring sage-grouse habitat. For instance, the projection of on-the-ground activities set

out in Table ES-1 of the 2018 EIS shows a reduction in restoration efforts, but a more conservation-oriented alternative would consider increasing these projects. Similarly, this alternative would evaluate how to enhance cooperation with the states while retaining more of the core protections and management approaches that made the previous plans the basis for the FWS determination that listing was no longer warranted under the ESA. This alternative be more environmentally protective and provide more certainty. We have developed a proposed alternative that would accomplish these goals, set out in detail in Attachment 2, incorporated herein by reference. BLM should also have considered alternatives to complete additional analysis of key protective provisions that it is proposing to eliminate through the DEIS, including Sagebrush Focal Areas (SFA). NV/CA Draft EIS at 1-8. BLM's scoping notice stated that the agency "seeks comments on the SFA designation" in response to the decision in Western Exploration, LLC v. U.S. Dep't of the Interior, 250 F. Supp. 3d 718 (D. Nev. 2017), which found BLM must conduct supplemental NEPA analysis in order to support the designation. 82 Fed. Reg. 47248, 47249 (Oct. 11, 2017). BLM should evaluate the impacts of the SFAs without the previously-proposed mineral withdrawal, which has now been withdrawn, in light of how those designations and the important protective measures they provide (in addition to the withdrawal protections) benefit sage-grouse habitat and how application can be better coordinated with the states. 4. An agency may tier only to an EIS of larger scope; BLM cannot tier its analysis of alternatives in the Draft EISs to the 2015 EISs, since the 2018 Draft EISs are based on a different purpose and need, and have a similarly broad scope. Instead of analyzing a full range of alternatives or the impact of its proposed Management Alignment Alternative, BLM seeks to rely on analysis from the 2015 Sage-grouse Plans. The 2018 Draft EIS states that: . . . issues were analyzed under most resource topics in the 2015 Final EIS, and these types of impacts on these resources are described in the range of alternatives in the 2015 Final EIS. The impacts of implementing the alternatives in this RMPA/EIS are within the range of alternatives previously analyzed. See NV/CA Draft EIS at1-11. The Draft EIS further states that it "is tiered to the [2015 EIS] … and incorporates by reference all of the descriptions of the affected environment and impacts analyzed in the [2015 EIS]. … Incorporation by reference and tiering provide opportunities to reduce paperwork and redundant analysis in the NEPA process." Id. at 1-2. However, an agency may tier a new EIS only to an existing EIS of larger scope. The 2018 Draft EIS for amending the 2015-Sage-grouse Plan as it applies to Nevada would affect the same scope as the 2015 EIS. "Tiering is appropriate when the sequence of statements or analysis is: (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis." 40 CFR §1508.28. Because the 2018 Draft EIS is not of "lesser scope" than the 2015 EIS, NEPA prohibits the BLM from "tiering" to the 2015 EIS. See 40 CFR §§ 1508.28, 46.140(c). Further, NEPA requires that "A NEPA document that tiers to another broader NEPA document in accordance with 40 CFR 1508.28 must include a finding that the conditions and environmental effects described in the broader NEPA document are still valid or address any exceptions." 40 C.F.R. § 46.140. The Draft EIS has not made a thorough finding in this regard and cannot justify relying on previous analysis of alternatives. 5. An agency may incorporate documents by reference, but those documents must still be appropriate for the current use and context; BLM cannot incorporate by reference analysis of alternatives from the 2015 Sage-grouse Plans into this EIS. In addition to stating that it is tiering to the previous analysis of alternatives, BLM also states it is incorporating the analysis of alternatives in the 2015 plan by reference. For instance, in the Draft EIS for Northwest Colorado, BLM states: "this RMPA/EIS has its foundation in the comprehensive 2015 Final EIS and ROD/ARMPA and incorporates those documents by reference-including the entire range of alternatives evaluated through the 2015 planning process." NV/CA Draft EIS at 2-1-2. However, in order to incorporate documents by reference, BLM "must determine that the analysis and assumptions used in the referenced document are appropriate for the analysis at hand." 43

C.F.R. § 46.135(a). As discussed above, the analysis of alternatives in the 2015 plans did not relate to the purpose and need of these amendments and is not appropriate to reference in this context. Further, as prescribed by the Council on Environmental Quality, "[a]gencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described." 40 C.F.R. § 1502.21. BLM has not met these requirements either. Simply stating that the previous analysis of alternatives are incorporated by reference does not explain why the analysis is sufficient, what was analyzed, how it pertains to the focus of these amendments or why it obviates the need for analysis of alternatives in these EISs. Moreover, failing to analyze alternatives in these EISs is not providing the public with a sufficient opportunity to review and evaluate the proposed course of action. BLM has attempted to rely on both authority to tier and authority to incorporate documents by reference without clarification and without actually meeting the applicable standards. BLM cannot simply look to the 2015 plans to avoid completing necessary NEPA analysis. The agency must analyze a reasonable range of alternatives in this NEPA process that addresses the new purpose and need.

Therefore, the only alternative that is reasonable and rational as a final decision in this case is to vacate the 2015 LUPAs entirely and return to the management that was in place when the 2010 FWS Findings were first published.

We request that the Bureau withdraw and then revise the draft RMPA/EIS for Nevada and Eastern California to include this conservation alternative, not just a No-Action Alternative or a Preferred Management Alignment Alternative.

From our analysis, American Bird Conservancy believes the Bureau's Nevada and Eastern California plan would weaken existing protection and fail to address the foreseeable impacts of mineral extraction. The plan leaves Greater Sage-Grouse at greater risk of being endangered, and the Bureau's inclusion of a conservation alternative is urgently needed if grouse are to be conserved. We urge the Bureau to withdraw the draft RMPA/EIS to include a conservation alternative to reduce habitat loss and population declines of the Greater Sage-Grouse in Nevada and Eastern California.

We strongly oppose the efforts to modify the 2015 Sage-Grouse Conservation Plans and ask that the agency choose the No-action alternative and to continue implementing the plans as approved in 2015.

The Management Alignment Alternative reduces total acreage in OHMA's by 17% overall. The agency suggests that this action is negligible since no allocation decisions are tied to this type of HMA. However, because management and allocation decisions can be tied to this type of HMA in the future a reduction in the acreage for this HMA reduces agencies' ability to adaptively manage sagebrush habitat and sage grouse populations based on the best available science.

Limitations inherent in PHMA, GHMA, OHMA, and SFA areas under the 2015 NVLMP and the "No Action" Alternative threaten the economic viability of the Projects, and thus the longterm economic impacts of the local communities who rely on the Projects for revenue, employment, etc. Specifically, under the No Action Alternative all projects are located in areas proposed for travel and transportation limitations/restrictions; major and minor rights of way are proposed to be avoided in Wood Gulch and Doby George; locatable mineral entry had been proposed for withdrawal in Wood Gulch (but has now been cancelled); and two sections along the Sonoma Range front are slated for disposal. With respect to

Doby George, the agency already has determined that WEX's "commitment to the environmental protection measures and monitoring activities included in the environmental assessment will minimize the risk of adverse impacts and unnecessary or undue degradation to public lands." (See BLM - Tuscarora Field Office, Doby George Exploration Project Environmental Assessment Decision Record (February 2013)). The Management Alignment Alternative provides for consideration of such protective measures, site specific information and adaptive management that appropriately balances use and conservation as required by FLPMA's multiple-use mandate.

exploration conducted by WEX of the Wood Gulch deposit and surrounding area lead to the discovery in 2013 of another, larger gold deposit approximately one mile east of the reclaimed Wood Gulch mine. This new deposit will be an economically significant discovery. This latter point is critical because, if withdrawn from locatable mineral entry as had been proposed or interfered with at a level that development does not occur, all potential for economic development in the very promising Wood Gulch area will be eliminated. While total withdrawal from mineral entry no longer appears to be a threat given the cancellation of the withdrawal, this demonstrates one of the reasons the No Action alternative is unacceptable and unlawful. Interference with development of the project would have serious implications both to WEX and the local and state communities. The Management Alignment Alternative provides for the use of best available science and site-specific information along with an appropriate Allocation Exception Process that is not only more compliant with the multiple-use mandate as compared to the No Action Alternative approach of "no go" outright prohibitions based on erroneous data and unsupported conclusions but also provides for much improved and effective conservation (as was explained in the litigation and prior comments submitted throughout this process).

Although the withdrawal was cancelled as unnecessary (which was appropriate) the segregation of these lands effective September 24, 2015 created a significant cloud of uncertainty on the project and continued development and had a chilling effect on Western's ability to continue raising necessary funds for its development. This is yet another reason why the No Action alternative should not be adopted and the BLM should consider this effect on WEX and similarly-situated mining companies with valid existing rights in the SEIS and should consider clarifying and confirming that such analysis must occur prior to any proposed withdrawal (based on existing law and regulations to avoid such harm in the future) in the future. WEX strongly supports and urges the BLM to adopt the provisions in the Management Alignment Alternative that eliminate the SFAs, remove any reference to any potential withdrawal of lands from mineral entry and reject in totality the No Action alternative the adoption of which would not comport with the law.

Proposals such as the No Action Alternative to limit development now not only violate the U.S. Mining Law, they provide no meaningful benefit to the greater sage grouse or its habitat in the area.

The comparison of alternatives does not address the problems with the 2015 plan regarding these issues: * MD SSS 2(A) - requiring application of the three percent cap on anthropogenic disturbance in proposed project areas. This policy will discourage concentration of anthropogenic disturbance and is a recognized flaw according to the 2015 plan in the DRMP/DEIS published by the BLM Idaho state office. It is recommended the Nevada plan align with the proposed Idaho plan in this regard. See also MD LR 1. * MD LR 5 - makes PHMA an avoidance area for transmission lines greater than or equal to 100 kV. This would effectively prevent development of utility-scale wind projects and should be eliminated. * MD LR 18 - in priority habitat, under the 2015 plan, new roads are only permitted for public safety or

administrative access or, if they will create no new surface disturbance. It is unclear how a new road could avoid creating new surface disturbance. In any event, the inability to construct new roads for purposes of access to authorized projects will effectively prevent authorization of new projects since access roads will be necessary to reach those projects. Consequently, this management direction has the effect of vetoing any new development projects in PHMA and should be changed or eliminated to remove this veto effect.

The No Action Alternative in the 2018 RMP DEIS cannot be adopted because the 2015 LUPs are not consistent with FLPMA and Department of Interior policies. Further, BLM must not incorporate portions of the alternatives considered in detail in the 2015 FEIS that are based on landscape-scale management into the Preferred Alternative in the 2018 RMP FEIS.

C.4.19 Assumptions and Methodology

We request adding management decisions based on science be tied to qualified biologists and accepted methodologies.

The Conservation Credit System (CCS) is the visionary yet bedrock tool of our NV SGMP for case-specific mitigation of human impacts on SG habitat. It must be validated and enabled by BLM within this review process.

Retain the BLM commitment to use the state's Habitat Quantification Tool through "solidifying" rather than "clarifying" it, while adopting the most current version verified by current best science. A mechanism for updates must be provided.

Quantitative Habitat Triggers (QHT) must be retained, while systematically refined by monitoring and current science information gained over time. The DEIS is non-specific as to how and how often analysis will be conducted, nor the tool to determine percent decline. To avoid variability and establish consistency, detailed methods, as in the current QHT are already established and must be retained.

Further, the Nevada Plan only provides for credits to be generated from positive conservation practices carried out on private land that qualifies as Greater Sage Grouse habitat. Since federally managed lands are not included in the program provided by the State of Nevada and the BLM's IM 2018-093 is being applied except on a voluntary basis - what linkage does the Nevada standard have to a BLM land management plan without full adoption of the Nevada Greater Sage Grouse Conservation Plan?

With the changes made by the U.S. Fish and Wildlife Service and their actions to no longer retain "net conservation gain" as a standard - what does Nevada's Plan, that hasn't been incorporated in land use plans as a whole, have to do with anything related to BLM's land management plans?

EPA recommends that the Final ETS explain how the impacts of a proposed project and any pursuant compensatory mitigation would be quantified on BLM administered lands in California in the event the State of California does not adopt the State of Nevada's HQT.

Prioritization for Field Checks BLM utilizes the LUPAs to set monitoring priorities and requirements. This will result in an unobtainable requirement for already stressed workloads for the agency; resulting in noncompliance that is out of the permittees control; and resulting in unwarranted third-party litigation due to failures simply to monitor. Specifically, the GRSG LUPA in (at least) Nevada includes the

following Management Direction that demonstrate these flaws / consequences: Nevada MD LG 11: Allotments within SFA, followed by those within PHMA, and focusing on those containing riparian areas, including wet meadows, will be priorities for field checks to help ensure compliance with the terms and conditions of the grazing permits. Field checks could include monitoring for actual use, utilization and use supervision. Issue #5, Recommendation 17: Any decision from this process would be amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180. See Issue #2. Issue #5, Recommendation 18: Monitoring schedules should be set and prioritized by the local office level on an annual or periodic bases based upon staff-levels and budgets. Local offices should not over-obligate their staff with monitoring requirements, but instead provide a framework to ensure all areas are receiving adequate staff time to manage the resource. Issue 5: DEIS Comments 17, 18: This DEIS at page 2-8 appears to delete MD LG 11 among other Decision numbers, however the document is hard to decipher whether the management alignment alternative just removes SFAs from those items, or deletes them in their entirety. BLM should remove MD LG 11 (and related MDs) in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

the BLM has failed to provide scientific support for the idea that the Conservation Plans need amending or how the Management Alignment Alternative will aid recovery of the species. Indeed, the 2015 Conservation Plans have not been given adequate time to make any conclusions regarding their efficacy. Amending them prematurely in the way the BLM proposes is dangerous and will harm Nevada and California long-term. The decision to amend plans was blatantly political in nature rather than the result of an identified management or scientific deficiency in the 2015 plans

The BLM should: Maintain a strong "net conservation gain" standard.

Additional details are needed in the Draft RMP Amendment and Draft EIS regarding the 3% disturbance cap for the biologically sensitive units, including how calculations are made. Specifically, the calculation process needs to be clearly defined with specific steps, so the same disturbance calculation results can be reproduced by different parties. Currently, the calculation process is not reproducible. The process needs to be clarified and transparent so the public has a clear understanding of existing and proposed disturbance in each Biologically Significant Unit.

The most current HQT version should be adopted by the BLM as the quantification tool. (Could this be included with the plan maintenance section, along with updating maps and science?) 2 2-11 Mitigation The SETT requests the following language, "would be calculated using the HQT result." to replace the existing language, "calculated using the HQT would be mitigated with the equivalent number of functional acres regardless of mitigation method."

Impacts eliminated over time still need to be addressed with term debits within the CCS. Any impacts not effectively avoided still need to be mitigated for. Language reflecting this view is requested.

A full species assessment should be conducted including but not limited to fish, mammals, birds other than sage-grouse, reptiles, and important native plants that could be adversely impacted.

C.4.20 Greater Sage-Grouse

Development on existing leases should be managed per regulations that are currently in place, which limit surface occupancy and disturbance. Years of research leave no doubt that sage-grouse do not do

well in close proximity to energy development. More development in the most important habitat will not help conserve the species

DRMP/EIS must clearly state the benefits that sage grouse receive when livestock are grazed on the rangelands that provide sage grouse habitat.

A clear description of how severely predation can limit sage hen populations should be included by the DRMP/EIS especially the effect on nest success and brood rearing. It is well documented that ravens, coyotes, bobcats, and other predators can greatly reduce the reproductive success and survival of sage grouse within both grazed and ungrazed rangeland habitats. Studies throughout sage grouse habitat areas indicate that herbaceous cover a.k.a. stubble height or shrub canopy that hides nest sites from biologists have no significant bearing on the rate of depredation. This plan should state that rigorous predator controls are essential if the goal is to have more sage grouse.

LCPD requests flexibility be developed into the three percent disturbance cap to accommodate for clustering proposed projects in areas that are already disturbed, and not restricting them based on the level of current disturbance in the Final RMPA/EIS.

The SEP requests that this DEIS explicitly acknowledge not only the presence of direct impacts, but also the presence of indirect impacts resulting from anthropogenic disturbance inside the SGMA

The SEP is also concerned that inadequate mitigation poses an elevated risk for placement of the GRSG on the endangered species list, and we request this potential listing be expressly considered when Undue or Unnecessary Degradation (UUD) is determined from potential projects.

GRSG population objectives: the federal government has no authority over wildlife management or populations or population objectives. In a letter to Secretary Zinke (8/19/17), Nevada Governor Brian Sandoval objected to Secretary Zinke's proposals to set GRSG population targets for Western states, citing no scientific support for these kinds of proposals. Our Governor stated that GRSG habitat must be managed properly in order to increase numbers and that habitat conservation by federal agencies is the more effective long term solution than a scientifically (and legally) questionable population augmentation approach. Statements on GRSG population objectives should be removed from the draft EIS.

C.4.21 Livestock Grazing

Instead, as with the proposal for the 13 RNAs, grazing should be incorporated into conservation practices to allow grazing management flexibility. Grazing should be used to assist in achieving conservation strategy, vegetation management, and fire management. BLM should avoid making large areas of public lands off limits to productive land use and this management tool under the guise of "undisturbed baseline reference areas."

BLM should more explicitly recognize that livestock grazing practices complement Sage-Grouse conservation and may improve habitat by sustaining a diversity of plants that are important to Sage-Grouse and by reducing the risk of wildfire that destroys the habitat.

DRMP/EIS must analyze the correlation of the loss of numbers of grazing livestock which in turn leaves vast quantities of vegetation available to burn but does not result in an abundance of sage grouse.

Issue #5: LUPAs Repeatedly Elevate Livestock Grazing to Priority Threat Multiple scientific studies document that livestock grazing and sage-grouse conservation can beneficially co-exist. Top threats to GRSG include rangeland wildfire, invasive weeds, and development pressure, not livestock grazing. Livestock grazing is not even in the top-ten list of threats. Yet, despite this, BLM has erroneously imposed landscape-wide regulatory changes on the grazing livestock industry for purposes of conserving habitat for a single species through an inflexible framework that is overly restrictive and fails to account for the site-specific conditions necessary to make informed decisions. The LUPAs elevated livestock grazing as a priority threat, even though improper livestock grazing is listed only as a secondary threat. Being only a secondary threat, any decision from this process should amend all Plans to remove any elements as related to permitted livestock grazing, and to defer GRSG management to the BLM via continued implementation of 43 C.F.R. Part 4100, subpart 4180 (see Issue #2) so as to provide focus on "improper grazing" where it may or may not exist, as opposed to "proper grazing". If BLM erroneously decides against this recommendation, it is critical that BLM work closely with key stakeholders to develop grazing strategies that can be applied to LUPAs across the West for consistency (see Issue #3). Our comments below are our best effort of grouping issues that need resolved in any LUPA amendment, with some recommendations on what language should move forward.

We are concerned with how the Sage grouse management plan will impact our grazing on the Bitner BLM permit. When it comes to livestock grazing, we feel that it is better to spread the cattle out across the whole allotment rather than grouping them exclusive to one are of the allotment one year and then to the other part of the allotment another year. Moderate grazing across the entire area reduces the fuel loads for fire season and therefore is protecting the sagebrush habitat from out of control burns with heavy fuel loads.

The LUPA fails to recognize that managed livestock grazing represents an important and cost-effective tool to achieve desired sage-grouse habitat conditions and to reduce wildfires. The livestock grazing restrictions in the LUPA will cause environmental harm because they will continue to increase the volume of highly flammable non-native invasive annual grasses and inevitably lead to more wildfires similar to those we have seen already in 2018. The increased fuels that will result from the economically burdensome and technically ill-advised livestock grazing restrictions in the LUPA will place a burden upon local fire districts and very likely continue to result in destruction of critical GSG habitat. The LUPA will also decrease the level of active management currently provided by ranchers that benefit GSG. When permitted to have livestock on the range, ranchers provide a constant presence to maintain water developments used by wildlife, provide first response to fires, keep a watchful eye, and provide a timely response to situations that may be detrimental to GSG habitat. The LUPA calls for arbitrary and unnecessary grazing restrictions that will force many Nevada ranchers out of business because the forage utilization thresholds in the LUPA are unrealistic and often unattainable based on Ecological Site Descriptions and State and Transition Models.

The livestock grazing objectives in Section 2.6.2 and Table 2-2 of the Final EIS/LUPA are completely inconsistent with the Elko County Plan because they establish prescriptive, range-wide, one-size-fits-all habitat management objectives that apply to the SFA as well as to the PHMA and GHMA. In contrast, the Elko County Plan, like the U.S. Fish and Wildlife Service's 2013 Greater Sage-Grouse Conservation Objectives: Final Report ("COT Report"), explicitly rejects the concept of uniform, range-wide prescriptions for managing the land: "Due to the variability in ecological conditions, species' and threat status, and differing cultural perspectives across the greater sage-grouse range, developing detailed,

prescriptive species or habitat actions is biologically untenable and inappropriate at the range-wide scale." (Elko County Plan, Page 112). Elko County estimates that the inconsistencies between the livestock grazing policies in the 2015 ARMPA compared to the Elko County Plan will cost the county roughly $31 million per year in lost agricultural productivity using USDA agricultural census data, and interfere with Elko's continuing implementation of its Conservation Plans. The Elko County Plan focuses on reducing threats to greater sage-grouse and its habitat (mainly wildfire, invasive grass species, and predation) while maintaining multiple uses of the land, whereas the 2015 ARMPA focuses on prohibiting and restricting regulated multiple uses (e.g., livestock grazing, mining, recreation, and access) in the SFA, PHMA, and GHMA. These fundamentally different approaches create irreconcilable inconsistencies between the 2015 ARMPA and the Elko County Plan and will interfere with Elko County's Greater SageGrouse habitat conservation programs. The COT Report clearly documents that regulated public land uses are not the main threats to greater sage-grouse habitat and that wildfire followed by the invasion of non-native grass species like cheat grass are the main threats to greater sage-grouse and its habitat. The Elko County Plan focuses on reducing these threats while at the same time adhering to FLPMA multiple use principles. It is thus consistent with federal law and will achieve far superior greater sage-grouse habitat conservation compared to the 2015 ARMPA. Section 6.2 of the Elko County Plan establishes six livestock grazing management objectives to address identified habitat issues with recommended actions. The actions include specific recommendations to restore, preserve, and enhance greater sage-grouse habitat through proper livestock grazing principles that focus on achieving sustainable multiple uses of the land. For example, Management Goal No. 1 states: "manage agriculture and livestock grazing to maintain and enhance conditions necessary for a properly functioning sagebrush community that addresses the long-term needs of agriculture, livestock grazing and greater sage-grouse habitat." Similarly, Management Goal No. 5 says: "Utilize and expand where appropriate existing grazing permits and new grazing permits designed to achieve rangeland health standards, to properly manage grazing and identify opportunities for livestock grazing to be used as a management tool to improve habitat quality and reduce wildfire threats." The multiple use approach and the recognition of the potential synergies between livestock grazing and greater sage-grouse habitat protection, enhancement and restoration in the Elko County Plan are lacking in the LUPA, which will interfere with the Elko County Plan through its limitations on grazing across the rangeland (especially in the SFA). The important synergy between proper livestock grazing and greater sage-grouse habitat restoration, conservation, and enhancement is a key premise of the Elko County Plan. The 2015 ARMPA livestock grazing restrictions interfere with this synergy and Elko County's ability to implement its local land use plans. The federal grazing policies for the past 50 years that have reduced livestock grazing on annual grasses have produced a dangerous build up of flammable fuel comprised mainly of non-native invasive annual grass species. This artificial buildup of flammable annual grasses has resulted in increased range fire frequency and intensity and is the primary cause of greater sage-grouse habitat destruction in Nevada and elsewhere in the Great Basin. The Elko County Plan contains a number of recommended actions that focus on reducing this fuel load with strategic grazing strategies to restore a more fire-resistant, resilient, and diverse vegetation community that will provide greater sage-grouse habitat. The livestock grazing restrictions in the 2015 ARMPA will interfere with this important component of the Elko County Plan and increase the buildup of nonnative grass species and inevitably lead to more frequent and intense wildfires and the future destruction of greater sage-grouse habitat. The inconsistency in livestock grazing policies between the Elko County Plan and the 2015 ARMPA will thwart Elko County's continued implementation of its local land and conservation plans and thus create serious and substantial environmental harm to greater sage-grouse and its habitat in Elko County and throughout Nevada.

"Essentially all rangeland use and value is dependent upon maintenance and enhancement of the primary landscape resources of soils, vegetation, and watersheds. August L. Hormay states that "…all renewable rangeland values stem directly or indirectly from vegetation. Sustained high-level production of these values therefore depends on proper management of the vegetation. The principal tool the rangeland manager has for managing vegetation is livestock grazing. It is the only force under firm control of the manager that can be applied on practically the entire range area.…desirable vegetation and the overall productive capacity of rangelands can be increased more rapidly with livestock grazing than without.…Livestock can be used to trample seed into the soil thereby promoting more forage and a better soil cover; to remove stifling old growth on plants, thus increasing plant vigor and production of useable herbage; to stimulate adventitious growth and higher quality forage; and to reduce fire hazard." (emphasis added) ("Principles of Rest-Rotation and Multiple-Use Land Management" USFS Training Text No. 4(2200)). Hormay explained that grazing management that is based on the physiological status and phenological development of the plants is the basis for keeping plants healthy and vigorous. Utilization levels have essentially no bearing on the longevity of the plants and very little value in management decisions. The principles of plant physiology as the basis for vegetation management taught by Hormay and other experts are a sound basis for grazing management in Eureka County. Eureka County natural resource strategy includes management based on the renewable nature of Eureka County's vegetation resources" (p. 6-14). o The DEIS actions for grazing are not based on this concept and grazing is generally disregarded as probably the best tool available for BLM to manage GRSG habitat to meet resource objectives while also stabilizing local economies and the industry uses of the land.

"Where monitoring history, actual use or authorization of Temporary Non-renewable grazing (TNR) demonstrates that supplemental use is continuously available, and can or should be used to improve or protect rangelands (e.g., reduction of fuel loads to prevent recurring wildfire), initiate a process to allocate such use to permittees as active grazing preference; Authorize use of supplemental forage during those years when climatic conditions result in additional availability" (p. 6-15). o The DEIS fails to acknowledge or implement a process for TNR or access to additional forage and conversion to active grazing preference if the criteria in our Plan is met.

The BLM is not accounting for indirect impacts of mining and oil extraction such as new roads, structures, buildings, and noise pollution; all of which are known to change Sage-Grouse habitat use patterns.

In coordination with federal agencies and state and local government planning agencies and in cooperation with interested members of the public, develop a land management mineral classification plan to evaluate, classify and inventory the potential for locatable mineral, oil, gas and geothermal, and material mineral exploration or development, to insure that lands shall remain open and available unless withdrawn by Congress or federal administrative action. To the extent practicable, land with high mineral or oil and gas values shall remain open for economic use" (p. 6-29). o This coordination and process has not occurred and was not included in the DEIS.

C.4.22 Lands and Realty

Although the disturbance cap language includes a "subject to" clause regarding the Mining Law and valid existing rights, it is unclear whether these disturbance caps preclude other disturbances that are reasonably incident to mining, such as roads, power lines, and other vertical structures. See 30 U.S.C. § 612. Thus, the BLM should remove the disturbance caps or, at the very least, clarify that the disturbance

caps do not apply to any land except BLM land and locatable mineral related disturbances should be exempt.

C.4.23 Socioeconomics

* Increase PILT payments to offset economic impacts to local governments, Counties and States to offset loss of production from withdrawn lands: An increase in Payments in Lieu of Taxes (PILT) should be considered for loss of revenue to government entities. An increase in PILT could be directly equated to possible revenues generated from lands impacted by proposed withdrawals or restrictions. In this manner, the weight of the proposed actions are more evenly distributed rather than falling on the shoulders of the few.

1- Incorporate New Technology: The use of new technology is recommended to enhance sage-grouse recovery. Drone surveillance of leks is suggested.
2- Using drones is also an option for reseeding and restoration of recent burn areas.
3- Instigate an early warning system for dry lightning weather systems.
4-Have on-the-ground fire fighting resources ready to deploy to areas at risk.

* National security concerns should be incorporated into any future EIS.

Conduct a detailed analysis of the impact of any proposed sage-grouse regulations on the existing economies in the counties affected, and recommend mitigation for undermining these economies

DRMP/EIS should put forth an analysis of economic effects that will include the direct result of regulatory decisions that prevent ranches such as ours from accessing and using our existing property rights within federally controlled lands. DRMP/EIS economic analysis must also recognize and quantify the value of our investment backed expectations.

The liability for costs of Takings of property must be included in any economic analysis of DRMP/EIS.

DRMP/EIS should complete an analysis of economic effects that will be the result of special treatment of sage grouse to the exclusion of other land uses

Sage-Grouse habitat would suffer from the environmental impacts associated with increased mining activity, but local communities would see little economic benefit. Since the Management Alignment Alternative amendments increase the likelihood of a listing for the species, the long-term economic impacts and regulatory burdens associated with a species listing would drastically outweigh the short-term economic benefits of a small increase in a largely non-permanent labor force.

Based on WEX's many years of professional experience working in mineral exploration and mining, the company believes that its new Gravel Creek discovery could be developed as an underground gold mine that could produce on the order of 2 million ounces of gold and 60 million ounces of silver over a period of 15 to 20 years. The FEIS did not contain an adequate socioeconomic analysis of the jeopardy to WEX and other mining companies - and WEX appreciates the inclusion of the proposed mineral withdrawal DEIS as part of the record on the SEIS to provide some of this information that must be included and considered to reasonably evaluate impacts of restricting such development - both to WEX and to local, state and our national communities.

EXECUTIVE SUMMARY ES-4 ES-9 through ES-11 Table ES-4 NCA asserts that the socioeconomic impacts analysis was never adequately completed for the 2015 ARMPA and by extension for the No Action Alternative. The analysis failed to calculate a detailed economic and fiscal impacts to counties, among other flaws. The University of Nevada, Reno has begun working on a Socioeconomic Baseline Data collection process for the entire State, and as part of that process will be performing a socioeconomic as well as fiscal impacts analysis for the greater sage-grouse plans. These models and the analysis will be conducted irrespective of the BLM's timeline and will not likely be completed during this process. NCA requests that the BLM work with UNR during this analysis.

3 3-9 P 1 & 2 The lack of adequate socioeconomic analysis from the 2015 ARMPA jeopardizes this process and all decisions in the future. The 2015 Land Use Plan Amendment did not quantify the social or economic effects of actions that impact these industries directly or detailed economic and fiscal impacts to counties, among other flaws, failing to rely upon the best available information. This analysis needs to be completed due to its importance.

Chapter 4 4.4 4-10 P 4 What about incomplete information regarding socioeconomics?

ES-4 ES-9 through ES-11 Table ES-4 Counties still assert that the socioeconomic impacts analysis was never adequately completed for the 2015 ARMPA and by extension for the No Action Alternative. The analysis failed to calculate a detailed economic and fiscal impacts to counties, among other flaws. The University of Nevada, Reno has begun working on a Socioeconomic Baseline Data collection process for the entire State, and as part of that process will be performing a socioeconomic as well as fiscal impacts analysis for the greater sage-grouse plans. These models and the analysis will be conducted irrespective of the BLM's timeline and will not likely be completed during this process. Counties request that the BLM work with UNR during this analysis.

3 3-9 P 1 & 2 The lack of adequate socioeconomic analysis from the 2015 ARMPA jeopardizes this process and all decisions in the future. Despite the fact that NACO and others made critical economic impact information available to the BLM through locally sourced data and reports, the 2015 Land Use Plan Amendment did not quantify the social or economic effects of actions that impact these industries directly or detailed economic and fiscal impacts to counties, among other flaws, failing to rely upon the best available information. This analysis needs to be completed due to its importance.

4.4 4-10 P 4 What about incomplete information regarding socioeconomics?

4 4-16 through 17 28 The lack of adequate socioeconomic analysis from the 2015 ARMPA jeopardizes this process and all decisions in the future. The BLM opted to conduct a qualitative analysis, despite the fact that NACO represented counties made critical economic impact information available to the BLM through locally sourced data and reports, the 2015 Land Use Plan Amendment did not quantify the social or economic effects of actions that impact these industries directly or detailed economic and fiscal impacts to counties, among other flaws, failing to rely upon the best available information. This analysis needs to be completed due to its importance.

ES-4 ES-9 through ES-11 Table ES-4 The socioeconomic impacts analysis was never adequately completed for the 2015 ARMPA and by extension for the No Action Alternative. The analysis failed to calculate a detailed economic and fiscal impacts to counties, among other flaws. The University of Nevada, Reno has begun working on a Socioeconomic Baseline Data collection process for the entire

State, and as part of that process will be performing a socioeconomic as well as fiscal impacts analysis for the greater sage-grouse plans. These models and the analysis will be conducted irrespective of the BLM's timeline and will not likely be completed during this process. Counties request that the BLM work with UNR during this analysis. The EIS needs to make it clear that this analysis is only focused on SFA changes. As it reads now, it makes it look like the Management Alignment Alternative would somehow facilitate mining activity. Mining activity would not increase in most of the state under the Management Alignment Alternative.

3 3-9 P 1 & 2 The lack of adequate socioeconomic analysis from the 2015 ARMPA jeopardizes this process and all decisions in the future. Despite the fact that Eureka County and others made critical Page 36 of 89 economic impact information available to the BLM through locally sourced data and reports, the 2015 Land Use Plan Amendment did not quantify the social or economic effects of actions that impact these industries directly or detailed economic and fiscal impacts to counties, among other flaws, failing to rely upon the best available information. This analysis needs to be completed due to its importance.

4.4 4-10 P 4 What about incomplete information regarding socioeconomics? Adding a bullet regarding the lack of quantifiable social or economic effects specific to counties, such as Eureka County, would be appropriate to add.

Hard triggers are an unreasonable burden on the economic security of Nye County as well as other Nevada counties. Soft triggers should be implemented only when absolutely necessary, considering all factors.

Wild horses and burros should be eliminated from sage-grouse habitat. The non-native wild horses and burros are not compatible with the limited resources and economic priorities of Nevada

C.4.24 Vegetation

In the EIS, Modifying Habitat Objectives is of great concern in that vegetation objectives may not be achievable across all ecological sites in sub-regions of the Great Basin. The landscape should be managed to provide a diversity of vegetation and composition at multiple scales. The work of Stringham and Snyder, 2017 should be considered, incorporated and referenced. Additionally, vegetation management criteria should be revised to provide for practices to achieve desired outcomes for rangeland health and greater sage grouse habitat. The recent Martin Fire in north central Nevada is an excellent example where fuel loads may have been reduced through a system of closely monitored and selective grazing. The BLM should look to a flexible system of vegetation management not tied to across the board habitat criteria, while allowing for timely grazing decision making.

During the past three years FIM Corporation in conjunction with Natural Resources Conservation Service (NRCS) and Bureau of Land Management (BLM) has removed conifers (pinyon-juniper) from over 1000 acres. We have found that the measured water flows from springs has increased and in fact doubled in volume. Furthermore, understoty herbaceous vegetation has increased and understory shrubs including sagebrush have increased in apparent vigor and production. Numbers of sage grouse in the vicinity of these treatments has also increased. DRMP/EIS should endorse these treatments as beneficial to wildlife including sage grouse.

The County would like to remind the public land management agencies that wildfire and altered fire behavior / fire cycles due to annual invasive species such as cheatgrass remain the top threat to Sage-grouse in Nevada. This point has never been clearer than on the heels of the Martin Fire that burned over 435,000 acres in five days (223,000 acres on July 7 alone), including 433,000+ acres of mapped Sage-grouse habitat, much of which is in Humboldt County. While the fire was driven by a combination of topography and severe fire conditions, extremely high fine fuel loads (reported via Inciweb on July 7 as over 200% of normal cheatgrass) contributed to the rapid fire spread and ineffectiveness of traditional fire suppression techniques. This highlights the Count'/s concern of over-regulation of livestock grazing and a continual reduction in grazing (as measured in Animal Unit Months, AUMs) since the 1970s, resulting in build-up of fine fuels, particularly in years with above average winter and spring precipitation. The inability of the BLM to respond in real-time to such fuel loads, and provide added flexibility and effectiveness for the most cost-effective pre-suppression tool (managed grazing) continues to concern the County. As such, the County urges the BLM to incorporate new management actions that allow increased grazing of fine fuels, particularly when fuel loading is high, as a means of wildfire pre-suppression. The County supports the implementation of any and all tools (Programmatic EIS Analysis, Allotment Management Plans, Temporary Non-Renewable Grazing Authorizations, Outcome Based Grazing, etc.) to ensure more effective use of grazing as a fuels reduction method. Until this happens, the County foresees similar outcomes to the Martin Fire. To that end, the County has attached an Article in Press titled Viewpoint: An Alternative Management Paradigm for Plant Communities Affected by Invasive Annual Grass in the Intermountain West. This article was developed by some of the most respected and experienced Range Management Professionals in the Great Basin, and the County fully supports their proposed 'Fuels Management Approach'.

C.4.25 Travel and Transportation Management

Travel Management Seasonal and Spatial Restrictions As discussed in Section IX, VERs granted by the U.S. Mining Law at 30 U.S.C. § 22 and FLPMA at 43 U.S.C. § 1732(b) provide rights of ingress and egress for the purpose of exploring for or developing minerals. The travel management restrictions and seasonal and spatial use and occupancy constraints in the GSG LUPs cannot substantially interfere with these ingress and egress rights. Consequently, the travel restrictions applicable to PHMA and GHMA shown on Figure 2-13b cannot apply to travel that is necessary for mineral purposes under the U.S. Mining Law. The 2018 FEIS and LUP need to make it clear that the restrictions shown on Figure 2-13b cannot be applied as 24/7 access restrictions precluding travel that is necessary for mineral exploration and development. On a project- and site-specific basis, certain time of day or seasonal restrictions of a limited duration may be appropriate. However, these restrictions cannot create significant barriers to mineral activities.

Does Not Allow for Administrative Use Under Travel Management It is critical that permittees have the ability to have administrative use of off-road vehicles for livestock management and improvement maintenance. Permittees are legally required by the grazing regulations and by their Grazing Permits to manage their livestock and to maintain their range improvements. Permittees need access to do both, and LUPA are hindering that ability. Specifically, the GRSG LUPA in (at least) Nevada includes the following Management Direction, which demonstrates these flaws / consequences: Nevada MD TTM: none of the TTM management decisions specifically allow for administrative or permittee access. Issue #7, Recommendation 25: LUPA should provide flexibility for manager discretion for off road vehicle use in order to manage range improvements and livestock. Travel restrictions should not impact the ability of permittees to access and manage allotments and livestock. Issue 7: DEIS Comment 25: The DEIS at

page ES-3 seems to suggest that "comprehensive travel management" is addressed (see also DEIS, Table ES-2; DEIS at page ES-11;) but the DEIS simply carries forward the management action from the 2015 ARMPA, as shown at the DEIS at Table 2-1 at page 2-5. However, all of this omits any discussion in the DEIS as to the issue and recommendation address above. It is critical that BLM consider and analyze this issue in the FEIS, and implement a proposed action in the ROD that adopts the recommendation.

The County is greatly concerned with the Winnemucca District BLM's Travel Management Plan, particularly due to the BLM's reliance on incomplete habitat mapping in the 2015 LUP. Travel restrictions interfere with the County's key responsibilities, including road maintenance, landfill plans, pipelines, and necessary local and state travel. The restrictions also prevent expansion in a manner that is entirely inconsistent with the County's development goals. This includes limiting industrial areas to those currently identified in the Master Plan, curtailing or disallowing public land disposals, and restricting the expansion of regional landfill to meet County growth predictions. The travel restrictions leave question for possible interference with use by closing or restricting access on numerous roads. The BLM should clarify that existing County roads (including those within RS 2477 rights-of-way) will not be restricted and this issue should also be addressed in the DEIS, as well as the current Travel Management Plan. This issue impacts the County's ability to build, monitor, and maintain roads, as well as its required access to public and private lands, as well as private inholdings including water rights. In addition, maintaining access to public lands is critical to managing fuels (invasive/noxious species) and fires by utilizing / implementing all means and tools available (i.e. managed grazing of both public and private lands).

C.4.26 Renewable Energy

Removing these Lithium deposits from potential use means severely hampering the nation’s ability to generate a “green economy” and address major concerns such as climate change.

C.4.27 Cumulative Impacts

Also, the DEIS does not conduct an adequate cumulative effects analysis, given new information is available and habitat has been lost since the analysis using 2013 data, rendering the cumulative effects analysis in the no action alternative inappropriate and in violation of NEPA.

BLM's cumulative impacts analysis is insufficient and invalid. The BLM is required to consider the cumulative environmental impacts to sage-grouse and sage-grouse habitat in the EIS it has prepared. Cumulative environmental impacts are defined as: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. 40 C.F.R. § 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Id. Cumulative impacts must be considered in the scope of an EIS. Id. § 1508.25(c). Despite the requirement to consider cumulative environmental impacts in the sage-grouse land use plan amendment EISs, the BLM has failed to do this adequately. For one, the BLM claims that the cumulative effects analysis from the 2015 sage-grouse land use plan amendment meets the cumulative effects analysis requirement that is needed now. See NV/CA Draft EIS at 4-19 ("This RMPA/EIS incorporates by reference the analysis in the 2015 Final EIS and the 2016 SFA Withdrawal Draft EIS, which comprehensively analyzed the cumulative impacts associated with these planning decisions under consideration in that process."). The inappropriateness and legal invalidity of this claim is discussed elsewhere in these comments. As noted above, tiering is only appropriate when a subsequent

narrower environmental analysis relies on an earlier broader environmental analysis. See 40 C.F.R. § 1508.28 (a) (stating that tiering is appropriate when a program, plan, or policy environmental impact statement is used to support a new analysis of "lessor scope" or which is site-specific). But we do not have that here; the scope of the current analysis is as broad as the 2015 analysis. There is no "step down" present here, therefore the cumulative impacts analysis from the 2015 plan cannot "incorporate[ ] by reference the analysis in the 2014 and 2015 Final EISs and the 2016 Draft Sagebrush Focal Area Withdrawal EIS. . . ." NV/CA Draft EIS at 4-19. In addition, BLM cannot simply incorporate the previous analysis by reference without justifying how it is appropriate and summarizing how it applies, neither of which has been done in the Draft EIS. See, 43 C.F.R. § 46.135(a). BLM also must ensure any incorporation by reference does not impede review by the public, which it surely does here. See 40 C.F.R. § 1502.21. Moreover, the purpose and need for the 2018 EIS differs from that of the 2015 EIS, which underscores why neither tiering nor incorporation by reference is appropriate. Secondly, in the Draft RMPA/EIS, the BLM lists a number of projects that it claims reflect the cumulative effects impacts that are applicable here. NV/CA Draft EIS 4-23-25. But this list of projects fails to incorporate many relevant projects that should be considered in the cumulative effects analysis. For example, while BLM discloses that it approved several mining projects between 2015 and 2017, it does not provide any information on new claims filed in habitat areas, including in SFAs following cancellation of the SFA Withdrawal EIS. NV/CA Draft EIS at 4-24. In addition, while in Nevada (and the other states), unspecified oil and gas lease sales are mentioned, see NV/CA Draft EIS at 4-25, the list is not detailed, and it is not apparent that it includes the quarterly sales scheduled for September and December 2018. The same is true in other states. For example, in Utah, the Utah DEIS says 646 acres of oil and gas leases will be offered in Habitat Management Areas (HMA) in June, but it fails to mention the 158,944 acres (with 45,227 acres that had been previously offered) that will be offered for lease in September. See https://eplanning.blm.gov/eplfrontoffice/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=1 03243&dctmId=0b0003e8810c3ec2. The same is true in other states. The BLM should review the list of projects shown in Table 4-5 causing cumulative impacts and ensure they are as comprehensive as is required to include "the incremental impact[s] . . . when added to other past, present, and reasonably foreseeable future actions." We note again the projects we have mentioned were not considered in the 2015 sage-grouse plan amendment EISs. These are "collectively significant actions taking place over a period of time" that must be considered in the cumulative impacts analysis, but which have not been. In addition, BLM should evaluate the cumulative effects of these projects across the planning areas of the 2015 Sage-grouse Plans. Finally, the BLM must account for any newly identified cumulative impacts. This includes the Martin Fire, which started in early July 2018 and burned more than 400,000 acres in northern Nevada. According to media reports, the Martin Fire "is the single largest fire that has burned in Nevada." evada Independent, "'It's gone, it's gone:' Nation's largest wildfire in Nevada devastates ranches, sage grouse" (July 12, 2018), available at https://thenevadaindependent.com/article/its-gone-its-gone-nations-largestwildfire-in-nevada-devastates-ranches-sage-grouse The impacts of the fire could be significant, since "[t]he vast majority of the fire burned in sensitive habitat for sage-grouse . . . the blaze is likely to be a setback for sustaining habitat for the bird." Id. Under Council on Environmental Quality (CEQ) guidance, BLM must consider the current aggregate effects of past actions in a cumulative impacts analysis. CEQ, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, available at https://ceq.doe.gov/docs/ceq-regulations-andguidance/regs/Guidance_on_CE.pdf . This means the BLM must consider what the impacts of implementing (and not implementing) the 2015 plans has been on cumulative impacts. BLM cannot just incorporate the 2015 plans by reference as its cumulative effects analysis, rather it must consider the

"identifiable present effects of past actions," which the 2015 plans clearly are. Under the 2015 plans BLM has taken hundreds of actions, and in total those actions have had cumulative environmental impacts. An analysis of those cumulative impacts is missing from the current EISs, which is not permissible. "A cumulative impact analysis "must be more than perfunctory; it must provide 'a useful analysis of the cumulative impacts of past, present, and future projects.'"" N. Plains Res. Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1076 (9th Cir. 2011) (quoting Kern v. U.S. Bureau of Land Mgmt., 284 F.3d 1062, 1075 (9th Cir. 2002) (additional citation omitted). "To be useful to decision makers and the public, the cumulative impact analysis must include "some quantified or detailed information; . . . general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided."" 668 F.3d at 1076 (quoting Ocean Advocates v. U.S. Army Corps of Eng'rs, 402 F.3d 846, 868 (9th Cir. 2004) (additional citation omitted). Here the BLM has offered nothing more than a perfunctory cumulative impacts analysis. There is no useful analysis of past projects; the dozens if not hundreds of approved projects implementing the 2015 sage-grouse plans. There is no quantifiable or detailed information about those projects, and there are not even any general statements about the cumulative impacts of those projects, many of which have undergone a NEPA analysis. Based on the above, it is evident the cumulative impacts analyses in the 2018 Draft EISs is invalid and must be expanded to fully address the cumulative impacts from the amendments.

This statement needs to offer more clarity, and the SETT requests clear articulation that what cannot be rectified through reclamation would represent a permanent disturbance within the State's Conservation Credit System and permanent debits would need to be sourced.

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Appendix D

Lek Buffer-Distances (Evaluating Impacts to Leks)

APPENDIX D
LEK BUFFER-DISTANCES (EVALUATING IMPACTS TO LEKS)

In addition to any other relevant information determined to be appropriate (e.g., state wildlife agency plans, local agency plans, and local information), the BLM, through project specific NEPA analysis, would assess and address impacts from the following activities using the lower end of the interpreted range of lek buffer-distances and guidance identified in the USGS Report, *"Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review",* Open File Report 2014-1239 (Mainer et al. 2014). Project specific analysis should use the lower end of the interpreted range in the report as a guideline for effects determination unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek[1] buffer-distances is as follows:

- linear features (roads) within 3.1 miles of leks;
- infrastructure related to energy development within 3.1 miles of leks;
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks;
- low structures (e.g., fences, rangeland structures) within 1.2 miles of leks in flat or rolling terrain;
- surface disturbance (continuing human activities that alter or remove the natural vegetation, excluding livestock grazing) within 3.1 miles of leks; and
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Justifiable departures to decrease or increase from these distances from the lek where impacts are anticipated, based on local information and data, best available science, landscape features (i.e., topography), and other existing protections (e.g., land use allocations, state regulations), or factors reducing visibility and audibility may be appropriate. The USGS report recognized "that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats

[1] Applicable to Active and Pending leks as defined by NDOW and CDFW

across the sage-grouse range." The USGS report also states, "various protection measures have been developed and implemented… [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands." All departures from the lek buffer-distances identified above for impact assessments would require appropriate analysis and disclosure as part of the NEPA.

The BLM would use the most recent active and/or pending lek data available from the state wildlife agency to assess project specific impacts.

For Actions in GHMA

The BLM, through the NEPA analysis, should avoid or minimize actions in GHMA that are within the applicable lek buffer distance identified above. If it is not possible to avoid or minimize impacts by relocating the project outside of the identified lek buffer-distance(s), the BLM may approve the project if:

- Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance, other than the applicable distance identified above, offers the same or a greater level of protection to Greater Sage-Grouse and/or its habitat, including conservation of seasonal habitat outside of the analyzed buffer area;
- The BLM determines that impacts to Greater Sage-Grouse and/or its habitat are minimized such that the project would cause minor or no new disturbance (e.g., co-location with existing authorizations);
- If range improvements do not impact Greater Sage-Grouse, or, range improvements which provide a conservation benefit to Greater Sage-Grouse such as fences for protecting important seasonal habitats;
- Mitigation (consistent with IM 2018-018: Compensatory Mitigation) has been developed and implemented which have the ability (alone or in concert with others) to protect the seasonal habitats within the buffer area and any residual impacts within the lek buffer-distances have been addressed.

For Actions in PHMA

The BLM, through NEPA analysis, should avoid actions in PHMA that are within the applicable lek buffer distance identified above. If it is not possible to avoid impacts by relocating the project outside of the identified lek buffer-distance(s), the BLM may approve the project, if in accordance with actions identified above for GHMA, and with input from the state fish and wildlife agency (and local agencies when appropriate).

The BLM would explain its justification for the analysis of buffer distances in its project decision record.

Appendix E

Required Design Features Worksheet

The worksheet below includes a list of design features that would be implemented for all authorized/permitted activities, consistent with applicable law (and consistent with the 2015 BLM Nevada and Northeastern California's Approved Resource Management Plan Amendment, MD SSS 2(C), SSS 3(B), and SSS 4. At the site-specific scale, BLM will document when an RDF is or is not applied to a particular project. If an RDF is not applied, this worksheet provides the BLM an opportunity to consistently document its rationale as to why that RDF if not applicable. This document will be placed in the project record and/or referenced in the project's NEPA analysis.

Project Name: **NEPA #:**

General RDFs		Applied	If RDF not applied, select reason:
RDF Gen 1:	Locate new roads outside of GRSG habitat to the extent practical.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 2:	Avoid constructing roads within riparian areas and ephemeral drainages. Construct low water crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 3:	Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 4:	Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 5:	During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

Project Name: **NEPA #:**

RDF Gen 6:	Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 7:	Require dust abatement practices when authorizing use on roads.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
NO RDF 8 Identified			
RDF Gen 9:	Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 10:	Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 11:	Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

Project Name: **NEPA #:**

RDF Gen 12:	Control the spread and effects of nonnative, invasive plant species (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 13:	Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 14:	Locate project related temporary housing sites outside of GRSG habitat.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 15:	When interim reclamation is required, irrigate site, in accordance with state laws, to establish seedlings more quickly if the site requires it.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 16:	Utilize mulching or other soil amendment techniques to expedite reclamation and to protect soils if the site requires it.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

Project Name:		**NEPA #:**	
RDF Gen 17:	Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 18:	When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 19:	Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 20:	To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Gen 21:	Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

Project Name: **NEPA #:**

RDF Gen 22:	Load and unload all equipment on existing roads, pull outs, or disturbed areas to minimize disturbance to vegetation and soil.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

In addition to the General RDFs, apply Lands and Realty RDFs to PHMA, GHMA, and OHMA as appropriate and consistent with applicable law:

Project Name: **NEPA #:**

Lands and Realty RDFs*		Applied	If RDF not applied, select reason:
RDF LR-LUA 1:	Where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes impacts in GRSG habitat. Use existing roads or realignments of existing roads to access valid existing rights that are not yet developed.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF LR-LUA 2:	Do not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF GEN (LR-LUA) 3:	Where necessary, fit transmission towers with anti-perch devices (Lammers and Collopy 2007) in GRSG habitat.	☐ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

***These RDFs also apply to other land use authorizations such as leases and permits**

In addition to the General RDFs, apply Fuels and Fire Management RDFs to PHMA, GHMA, and OHMA as appropriate and consistent with applicable law:

Project Name: **NEPA #:**

Fuels and Fire Management RDFs		Applied	If RDF not applied, select reason:	
RDF WFM 1:	Power-wash all firefighting vehicles, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATVs), prior to deploying in or near GRSG habitat to minimize the introduction and spread of undesirable and invasive plant species. (This is not applicable to initial attack vehicles.)	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF WFM 2:	Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF WFM 3:	Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting and maintaining perennial vegetation (e.g., greenstrips) paralleling road rights-of-way.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		

In addition to the General RDFs, apply Fluid Minerals RDFs to PHMA, GHMA, and OHMA as appropriate and consistent with applicable law:

Project Name: **NEPA #:**

Fluid Minerals RDFs		Applied	If RDF not applied, select reason:	
RDF Lease FM 1:	Co-locate power lines, flow lines, and small pipelines under or immediately adjacent to existing roads (Bui et al. 2010) in order to minimize or avoid disturbance.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF Lease FM 2:	Cover, create barriers, or implement other effective deterrents (e.g., netting, fencing, birdballs, and sound cannons) for all ponds and tanks containing potentially toxic materials to reduce GRSG mortality.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF Lease FM 3:	Require installation of noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Require applicable GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF Lease FM 4:	Ensure habitat restoration meets GRSG habitat objectives (Table 2-2) for reclamation and restoration practices/sites (Pyke 2011).	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		

RDF Lease FM 5:	Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoil management, and revegetating cut-and-fill slopes.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Lease FM 6:	Restore disturbed areas at final reclamation to the pre-disturbance landforms and meets the GRSG habitat objectives (Table 2-2).	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Lease FM 7:	Use only closed-loop systems for drilling operations and no reserve pits within GRSG habitat.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Lease FM 8:	Place liquid gathering facilities outside of GRSG habitat. Have no tanks at well locations within GRSG habitat to minimize vehicle traffic and perching and nesting sites for aerial predators of GRSG.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Lease FM 9:	In GRSG habitat, use remote monitoring techniques for production facilities and develop a plan to reduce vehicular traffic frequency of vehicle use (Lyon and Anderson 2003).	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

RDF Lease FM 10: Use dust abatement practices on well pads.	☐ Yes	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
	☐ No	☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
		☐	A specific RDF will provide no additional protection to GRSG or its habitat.
	Rationale if RDF is not applied:		
RDF Lease FM 11: Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.	☐ Yes	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
	☐ No	☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
		☐	A specific RDF will provide no additional protection to GRSG or its habitat.
	Rationale if RDF is not applied:		
RDF Lease FM 12: Apply a phased development approach with concurrent reclamation.	☐ Yes	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
	☐ No	☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
		☐	A specific RDF will provide no additional protection to GRSG or its habitat.
	Rationale if RDF is not applied:		
RDF Lease FM 13: Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).	☐ Yes	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
	☐ No	☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
		☐	A specific RDF will provide no additional protection to GRSG or its habitat.
	Rationale if RDF is not applied:		

Project Name: **NEPA #:**

RDF Lease FM 14:	In GRSG habitat, 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 (Doherty 2007): • 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	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF Lease FM 15:	Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF# _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

In addition to the General RDFs, apply Locatable Minerals RDFs to PHMA, GHMA, and OHMA as appropriate and consistent with applicable law:

Project Name: **NEPA #:**

Locatable Minerals RDFs		Applied	If RDF not applied, select reason:	
RDF LOC 1:	Install noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Apply GRSG seasonal timing restrictions when noise restrictions cannot be met (see Action SSS 6).	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF LOC 2:	Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF LOC 3:	Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		

Project Name: **NEPA #:**

RDF LOC 4:	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 (Doherty 2007): • 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	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF LOC 5:	Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF LOC 6:	Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling, and revegetating cut and fill slopes.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	
RDF LOC 7:	Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.	☐ Yes	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
		☐ No	☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:	

In addition to the General RDFs, apply Comprehensive Travel and Transportation Management RDFs to PHMA, GHMA, and OHMA as appropriate and consistent with applicable law:

Project Name: **NEPA #:**

Comprehensive Travel and Transportation Management RDFs		Applied	If RDF not applied, select reason:	
RDF CTTM 1:	Rehabilitate roads, primitive roads, and trails not designated in approved travel management plans.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		
RDF CTTM 2:	Reclaim closed duplicate roads by restoring original landform and establishing desired vegetation in GRSG habitat in accordance with GRSG habitat objectives (Table 2-2) as identified in travel management planning.	☐ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale if RDF is not applied:		

Appendix F

Adaptive Management Plan

APPENDIX F
ADAPTIVE MANAGEMENT PLAN

INTRODUCTION

Adaptive management is a decision process that promotes flexible resource management decision-making. These decisions can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Carefully monitoring these outcomes both advances scientific understanding and helps with adjusting resource management directions as part of an iterative learning process.

On February 1, 2008, the Department of the Interior published its Adaptive Management Implementation Policy (522 DM 1). The adaptive management strategy presented in this Approved RMP Amendment complies with this policy and direction, as well as the Department of the Interior's Adaptive Management Technical Guide (DOI 2009).

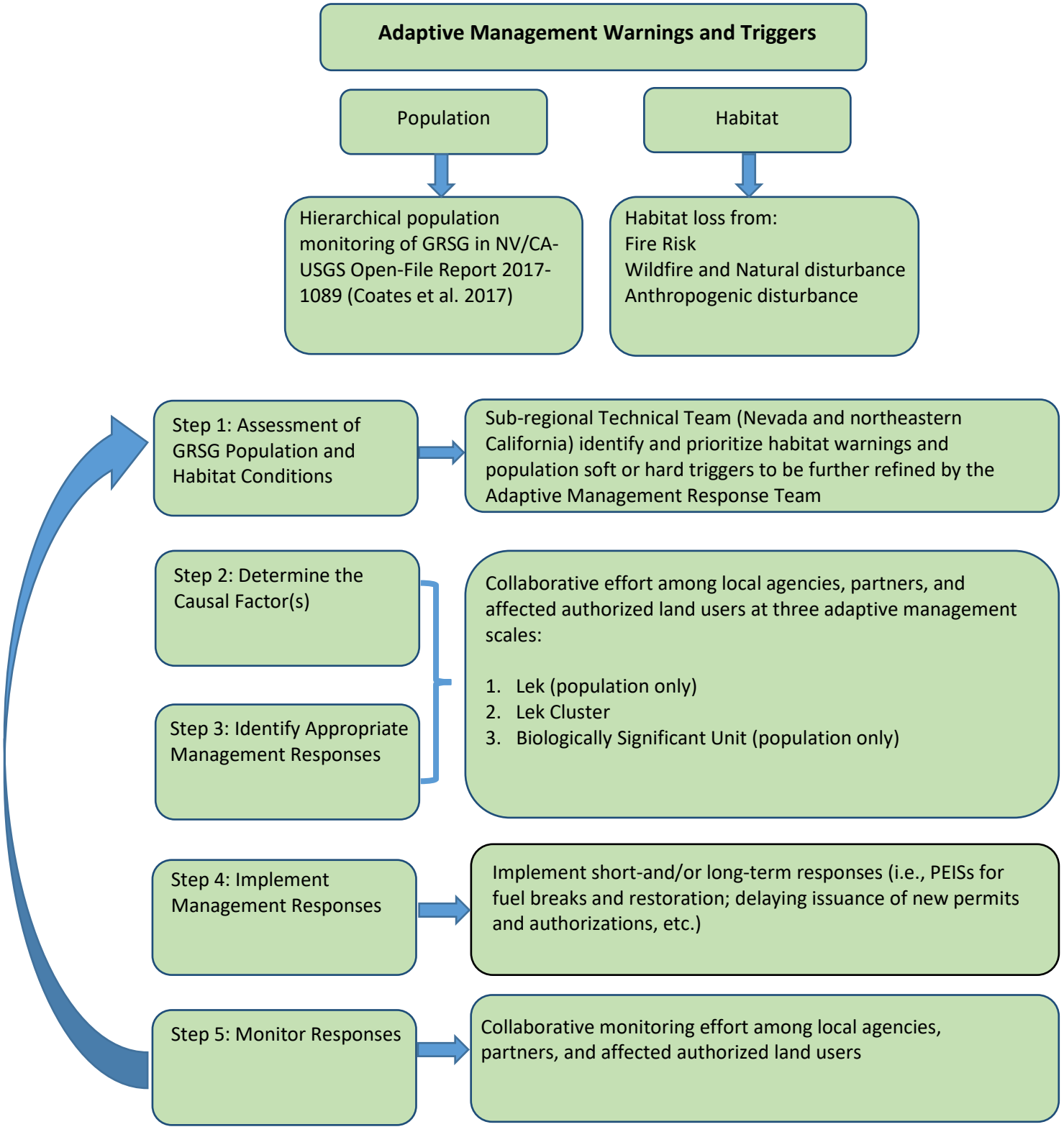
Adaptive management would help identify if Greater Sage-Grouse (GRSG) conservation measures presented in this Approved RMP Amendment contain the needed level of certainty for effectiveness. Principles of adaptive management are incorporated into the conservation measures in the Approved RMP Amendment to lessen threats to GRSG and its habitat, thereby increasing the likelihood that the conservation measures and plan would be effective in reducing threats to them.

The following provides the BLM's adaptive management strategy for the Nevada and Northeastern California Greater Sage-Grouse Sub-region Approved RMP Amendment.

This adaptive management strategy includes warnings, soft and hard triggers and responses. Triggers are not specific to any particular project, but identify GRSG population and habitat thresholds outside of natural fluctuations or variations (with the exception of wildfires). Triggers are based on the two key metrics that are being monitored; population status and habitat loss. Adaptive management, with specific triggers, provides additional certainty that the management actions included in this Approved RMP Amendment are robust and able to respond to a variety of conditions and circumstances quickly and effectively to conserve the GRSG and its habitat. Reaching a trigger would initiate a local-state-federal interagency dialogue in collaboration with affected authorized land users to evaluate causal factor(s) and recommend adjustments to implementation-level activities to reverse the trend. BLM would strive to use a collaborative process with stakeholders, appropriate state and local agencies, and affected authorized land users when developing and implementing management responses when a trigger has been identified.

A sub-regional (Nevada and northeastern California) technical team, consisting of BLM, Forest Service, USFWS, NDOW, CDFW, SETT, USGS, University of Nevada-Reno, and other appropriate federal, state, and local agencies would coordinate, prioritize, and implement specific habitat restoration efforts targeted at multiple spatial scales. This adaptive management strategy calls for a collaborative effort that would result in individual plans for the recovery of declining GRSG populations. These plans would be focused based on discussion of how threats impact GRSG and its habitat, and the relative importance of various conservation measures. The outcomes would be used to assist local efforts in identifying and prioritizing areas to enable efficiencies and pool resources. This would increase the likelihood that GRSG population and habitat declines can be addressed effectively through collaboration, stewardship, and conservation. The principles of adaptive management would be incorporated into the conservation measures that lessen threats to GRSG and its habitat.

Figure F-1. Adaptive Management Process



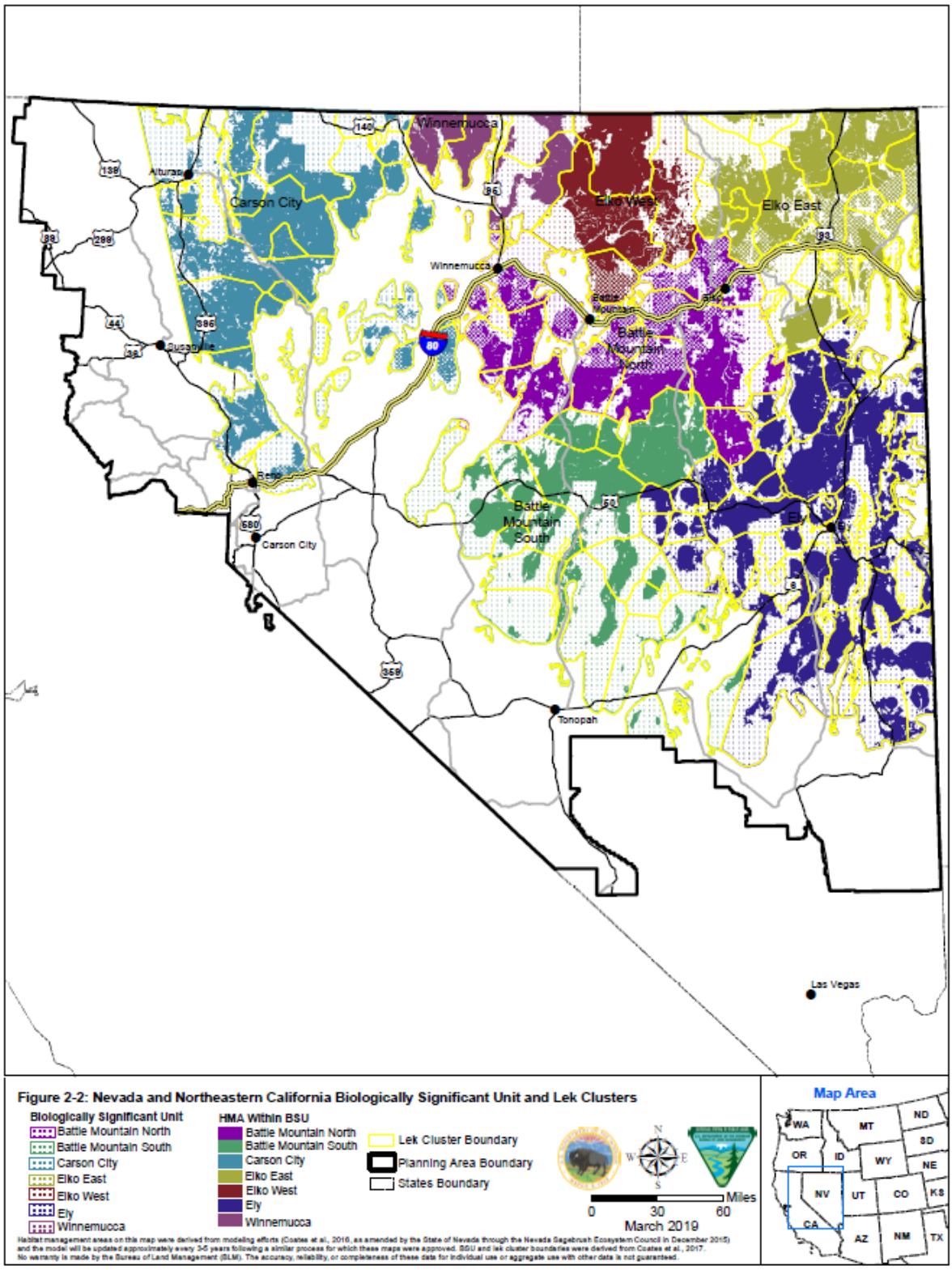
ADAPTIVE MANAGEMENT ANALYSIS SCALES

The scales used to analyze population triggers and apply management responses are at the individual lek, lek cluster, and biologically significant units (BSU) as defined below (Figure 2-2). Adaptive management responses would only apply to habitat management areas (HMAs), which includes Priority, General and Other HMAs within these scales. Habitat adaptive management warnings and triggers would be analyzed only at the lek cluster scale. The boundaries of the BSU and lek clusters may be adjusted over time, based on the understanding of local GRSG population interactions, genetic sampling and climate variation. Population and habitat analysis used to identify warnings and triggers may be updated based on new science and advances in technology (e.g., integrated population models).

The hierarchy of GRSG population and habitat scales is as follows:

- Lek—Individual breeding display sites where male and female GRSG congregate, with males performing courtship displays to gain mating opportunities with females.
- Lek cluster—A group of leks in the same vicinity, among which GRSG may interchange over time and representing a group of closely related individuals.
- BSU— represents nested lek clusters with similar climate and vegetation conditions.

Figure 2-2. Biologically Significant Units and Lek Clusters for GRSG in the Nevada and Northeastern California Sub-region.



DEFINITIONS OF ADAPTIVE MANAGEMENT WARNINGS, SOFT TRIGGERS, AND HARD TRIGGERS

Population

Warnings

Adaptive management population warnings are identified within the GRSG state-space model (Coates et al. 2017) (described below) that could lead to reaching a population soft or hard trigger. Warnings are the result of cumulative factors that negatively affect population growth rate. A warning could be identified when population rates of change (lambda) within any of the three analyzed spatial scales falls below an established threshold as defined in Coates et al. (2017).

Soft Triggers

Soft triggers represent a threshold that indicates management actions should be considered at the project or implementation level to address GRSG population declines.

Hard Triggers

Hard triggers represent a threshold that indicates that immediate action needs be considered to address significant deviations from GRSG population declines.

Habitat

Warnings

Adaptive management habitat warnings include fire risk (e.g., annual and perennial fine or woody fuel loads, fire risk models, etc.), the occurrence of wildfire or natural disturbance (e.g., sagebrush die-off) larger than 1,000 acres, or new anthropogenic disturbance that results in direct and indirect effects as determined using the Habitat Quantification Tool (HQT; DCNR 2018) within a lek cluster.

Fire risk would be analyzed using various applicable data sources and support tools including but not limited to current vegetation composition and biomass, precipitation, fire regime condition class, fire risk or predictive models, and other applicable resources to identify areas that have the potential for high fine or woody fuel loads or have a high probability for wildfire risk. The Great Basin Coordination Center and appropriate fuels management specialists would also be consulted to refine areas of high fire potential.

Disturbances of any size could have significant impacts to GRSG habitat. Due to the complexity of identifying the extent and severity of habitat disturbances in a consistent process, this effort would focus on disturbances to GRSG habitat as reported by state and federal agencies (e.g., wildfires > 1,000 acres) that would be considered warnings in order to assess the magnitude of each disturbance (as identified below in Triggers).

Triggers

Habitat triggers are warnings evaluated by a statewide technical team of specialists (as defined in the Adaptive Management Analysis section) that are determined to warrant significant management responses to address GRSG habitat declines. Generally, a management response would be warranted if an action could be taken that could effectively improve conditions for GRSG.

Management Responses

If a trigger is reached, the appropriate land management agency(s) would evaluate the appropriate management responses to address the known or probable causes of the decline in GRSG habitats or populations, with consideration of local knowledge and conditions in coordination with appropriate federal, state, and local agencies, and affected authorized land users. See Step 3 below for examples of potential management responses.

ADAPTIVE MANAGEMENT POPULATION ANALYSIS

Population Rate of Change Calculation for Triggers

The most current version of the Hierarchical Population Monitoring of Greater Sage-Grouse in Nevada and Northeastern California (USGS Open-File Report 2017-1089; Coates et al. 2017) state-space model would be used to estimate the rate of GRSG population change (lambda) and the number of males at three hierarchically nested spatial scales: individual lek, lek cluster, and BSU. Lek count data provided by NDOW and CDFW would inform the state-space model and be used to determine thresholds for population stability and decoupling from higher-order scales. Some lek clusters may need additional monitoring of leks to gain adequate sampling data in order to be modeled (Coates et al. 2017).

In addition to analyzing annual lek trend data, the benefit of using the USGS state-space model is that it differentiates whether a population decline is likely due to localized disturbances that may be more manageable, or connected to a larger scale, regional environmental or climactic conditions that are typically less manageable. A trigger is less likely to be reached at smaller spatial scales (e.g., lek, lek cluster) if regional environmental (e.g., BSU) conditions are influencing population decline (Figure 2). The framework also accounts for natural variations in populations, which would allow managers to target populations that can be most affected by adaptive management responses.

Population Soft and Hard Triggers

On an annual basis as lek data are finalized by the state wildlife management agencies, the USGS state-space model would be used to establish population rates of change at the lek, lek cluster, and BSU levels. The rate at which a population trend destabilizes (population decline) and decouples from the trend at the associated higher-order scale would dictate whether or not a soft or hard trigger is reached. Thresholds for stability and decoupling for soft and hard triggers were initially determined from simulation analyses that used 17 years of lek data (2000-2016). These simulations estimated the range of values where management actions would have an effect on stabilizing population change or synchronizing decoupled scales. The threshold value for each criteria represents the most likely threshold value (from a range of values), that if crossed, would associate most strongly with continued decline or decoupling if management action is not taken (Coates et al. 2017).

Information on the methods used to determine if a soft or hard trigger for GRSG populations has been reached at the lek, lek cluster or BSU can be found in Coates et al. 2017, *Hierarchical population monitoring of greater sage-grouse (Centrocercus urophasianus) in Nevada and California—Identifying populations for management at the appropriate spatial scale*: U.S. Geological Survey Open-File Report 2017-1089 (as updated by USGS), in the Evaluation Process Section.

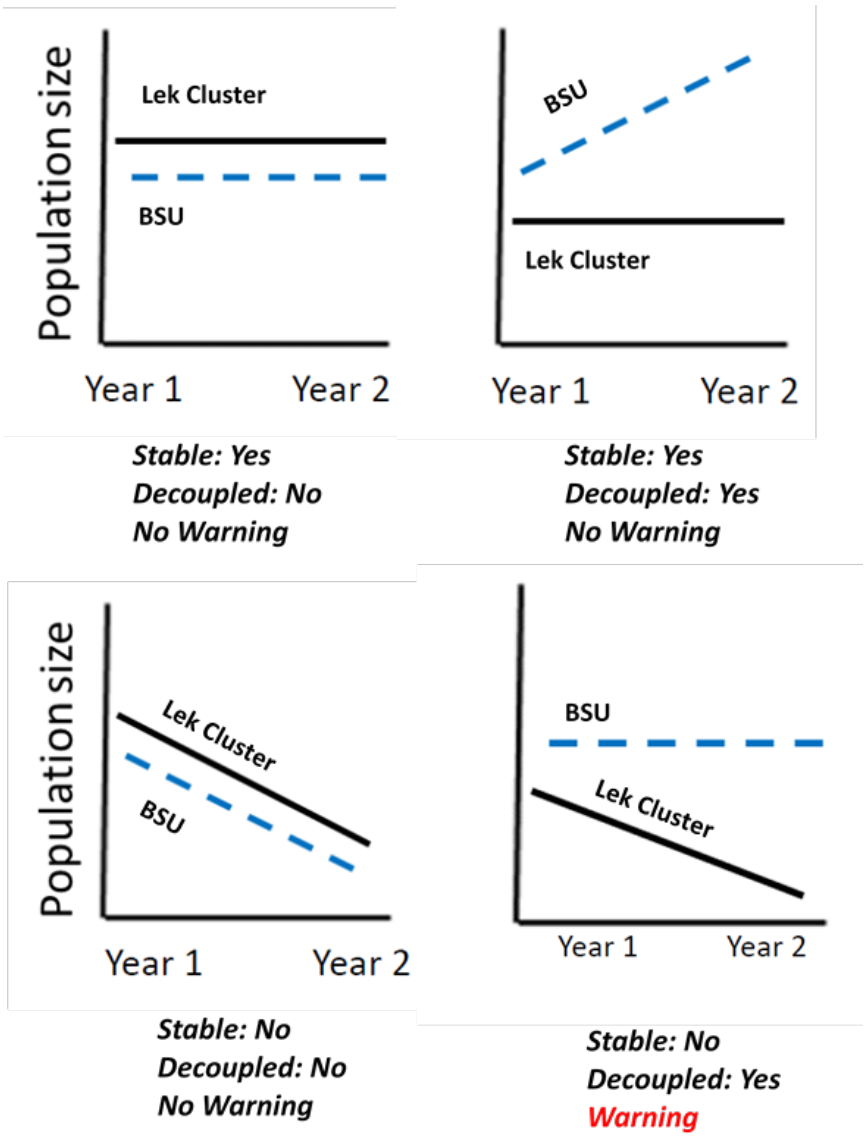


Figure F-2. Scenarios depicting population stability (trend) and decoupling from the higher-order spatial scales (Coates et al. 2017). A population that is destabilized and decoupled is considered a warning at that spatial scale. Multiple annual warnings are required to reach a soft or hard population trigger.

ADAPTIVE MANAGEMENT HABITAT ANALYSIS

Habitat Trends for Warnings and Triggers

Warnings for habitat would be evaluated at the lek cluster scale based on annual habitat loss within HMAs. Habitat warnings and triggers would be evaluated using the process described below and would not apply to the BSU scale.

Habitat Warnings and Triggers

1. At the lek cluster scale:
    a. Habitat warnings would be evaluated annually by a statewide technical team of specialists (similar to a science work group) from the BLM, Forest Service, NDOW and/or CDFW, SETT, USGS, FWS, UNR, and other appropriate local, state or federal partners to determine the ecological impact and magnitude of the habitat warnings. The statewide technical team would determine which habitat warnings warrant a management response. Within a lek cluster, habitat warnings that warrant a significant GRSG focused management response can be considered triggers and prioritized based on available science, site-specific conditions, and ecological criteria (e.g., ecological site description, resistance and resilience, state and transition models, disturbance response group, invasive plant species dominance, etc.). The statewide technical team would make a recommendation to the appropriate agency's authorizing official responsible for addressing the trigger(s). More information on prioritization is included under Step 2.
    b. Habitat warnings that had insufficient funds and resources available to implement significant GRSG focused projects would remain on the habitat warning list and could be re-prioritized as a trigger if warranted in the next annual evaluation by the sub-regional technical team. The sub-regional technical team would also review the trigger list annually and determine whether a habitat trigger remains on the list or should be removed.
    c. If a population soft trigger is reached within a lek cluster that has also reached a habitat soft trigger, this may result in a population hard trigger response for that lek cluster, as determined by the sub-regional technical team.

CAUSAL FACTOR ANALYSIS AND MANAGEMENT RESPONSE PROCESS

Step 1-Assessment of GRSG Population and Habitat Conditions: The sub-regional technical team and other appropriate state and local agency partners would use the processes outlined above to evaluate population and habitat data to identify population and habitat warnings and triggers that have been reached. The sub-regional technical team would meet semi-annually during the spring and late summer or fall of each year to evaluate population data using the results of the USGS state-space model (Coates et al. 2017, most recent version), habitat data from the land and resource management agencies (BLM, Forest Service, and other state and local agencies) and data sources to identify the potential for high fine or woody fuel loads that indicate a high probability for wildfire risk. The data sources may be adapted as new information becomes available from appropriate partners. Some applicable data sources are outlined in the habitat warnings definitions section.

Habitat warnings that warrant a management response would be elevated to the level of a trigger. Following the identification of habitat triggers, a list of criteria and a ranking system that considers available science, site-specific conditions, ecological criteria (e.g., ecological site descriptions, resistance and resilience, invasive plant species dominance, etc.), and available resources would be used to consistently prioritize and rank habitat triggers among lek clusters. This prioritization is only an initial

evaluation, as the adaptive management process progresses, local information and expertise would be used to further refine the priority list for habitat triggers. Once the annual population and habitat information has been assessed and hard or soft triggers have been identified, the appropriate land management agency would notify the appropriate local districts and field offices.

Step 2-Determine the Causal Factor(s): Within four weeks (or sooner if possible) after Step 1 is completed and population and habitat triggers have been identified, the appropriate land management agency, in coordination with the sub-regional technical team would organize and invite federal, state and local agencies and partners (including but not limited to local area conservation groups, grazing permittees, and other affected authorized land users,) to participate, comment, and provide input during the causal factor analysis. This group would be referred to as the 'Adaptive Management Response Team' (AMRT). The causal factor analysis would be completed as soon as practicable given available resources. The casual factor analyses area at each scale are as follows:

a. Lek (population only): GRSG seasonal habitats associated with the lek. An individual lek boundary is defined as a minimum of a four-mile buffer around a lek;
b. Lek cluster: GRSG seasonal habitats associated with the lek cluster. A lek cluster boundary is defined by minimal GRSG movement between clusters so demographic rates are influenced by birth/death rates rather than immigration/emigration (as delineated by Coates et al. 2017, most recent version);
c. BSU (population only): GRSG seasonal habitats associated with the BSU. A BSU boundary is defined by similar environmental conditions where GRSG population dynamics are likely more driven by larger scale variations (e.g., climate), as delineated by Coates et al. 2017, most recent version.

The causal factor(s) for habitat triggers could be fire risk, wildfire, natural causes or anthropogenic disturbances based on the analysis conducted in Step 1. To identify the causal factor(s) of a population trigger, the AMRT would consider all available information and examine potential causal factor(s). Questions to be answered may include, but are not limited to the following:

- Did factors and events outside the triggered scale contribute to population or habitat decline (e.g., previously burned areas within the lek cluster or BSU that have not recovered)?
- Did the event or outcome arise from the interaction of more than one potential causal factor(s)?
- What natural and human-caused events have occurred within the causal factor analysis area?
- What is the magnitude of the impact to GRSG populations or habitat (e.g., what is the current anthropogenic disturbance in the area and how would these changes impact GRSG populations or habitat)?
- Can GRSG populations and/or habitat recover on its own without intervention?
- What is the expected length of the recovery period?
- Can the management actions already included in the 2015 Approved RMP Amendment and the 2019 Approved RMP Amendment accelerate recovery or are different actions necessary?

Findings from the causal factor analysis process would be documented in a report, which would be prepared by the AMRT. The AMRT report would also include recommendations for additional analyses or data collection if applicable. If the causal factor(s) cannot be determined, the AMRT would address threats that were identified and continue to explore opportunities for conservation in areas where impacts have occurred, when warranted.

Step 3-Identify Appropriate Trigger Responses: The AMRT would identify appropriate trigger responses to be applied to the individual lek (population only), lek cluster, and/or BSU (population only) that reached a trigger. Appropriate management responses would be included in the AMRT report.

Management responses would only be applied within HMAs. Both reactive and pro-active management responses may be applied to address existing or anticipated threats in areas where warnings or triggers have been reached. In either case they should be strategically targeted to address the causal factor(s) of the existing disturbance or to address similar threats that led to a warning or trigger within a lek, lek cluster, or BSU. This plan identifies two main response groups to address fine and woody fuel loads that may require different management responses with varying spatial and temporal scales associated with the response:

1) Short-term management – Identify areas of high fine fuel loads that would benefit from fuels management treatments (e.g., targeted grazing, season specific fall grazing, fuel breaks, etc.) of annual grasses.
2) Long-term management – Identify areas of high woody fuel loads to strategically target areas for appropriate fuel breaks, and vegetation treatments to better manage wildfires when they do occur.

Types of short- and long-term management or implementation actions that the appropriate land management agency(s) would evaluate or consider applying within an individual lek (population only), lek cluster, or BSU (population only) to address triggers may include, but are not be limited to the following:

- Delaying issuance of new permits and authorizations (e.g., geothermal, solar, wind, oil and gas, etc.);
- Delaying issuance of new or pending rights-of-ways outside of existing designated corridors;
- Use of tools and techniques that are included within the Programmatic Environmental Assessments for targeted grazing that are currently under development;
- Proactively apply targeted grazing to reduce fine fuels (e.g., use of free use permits, Temporary non-renewable grazing permits, etc.)
- Use of full force and effect decisions when appropriate to address fire risk from fine or woody fuels;
- Requiring new permits and authorizations to include an adaptive management process if additional impacts to GRSG populations or habitats are identified;
- Strategically place fuel breaks depending on landscape/habitat continuity, vegetation composition, fuel loads, accessibility, and use of Programmatic EISs for Fuel Breaks and Restoration Management;
- Use existing or develop new predictive tools to forecast and plan for anticipated plant growth based upon annual and seasonal precipitation in unison with existing (from previous growing season(s)) fine and woody fuels presence;
- Halting or delaying planned prescribed fire;
- Increasing fire prevention patrols;
- Increasing fire prevention inspections of motorized equipment;
- Prohibiting open campfires outside of established fire pits and outside of stoves in designated recreation areas during high fire seasons;
- Increasing inspections to ensure Required Design Features (RDFs) for limiting the spread of invasive plants are being implemented;
- Increasing surveys to detect and treat new infestations of invasive plants, especially invasive annual grasses;

- Delaying certain planned vegetation treatments until after the breeding and brood-rearing season;
- Halting, delaying, accelerating, or stimulating planned fuels treatments in GRSG winter habitat, depending on conditions and needs;
- Installing anti-perching devices on tall structures;
- Installing bird flight diverters on guy wires and fences;
- Delaying planned construction of new recreation facilities (e.g., kiosks, toilets, and signs);
- Increasing litter patrols in and around heavily used recreation areas;
- Increasing educational contacts with visitors concerning the role of litter and garbage in attracting GRSG predators;
- Increasing enforcement efforts on travel restrictions;
- Limiting noise and/or light pollution;
- Voluntary written agreements for items outside of BLM jurisdiction (such as activities on adjacent non-BLM land);
- Habitat improvement projects including pinyon and/or juniper removal;
- Developing Allotment Management Plans;
- Conducting emergency wild horse and burro gathers;
- Off-site water development by the water rights holder; and/or
- Voluntary establishment of livestock herding/stockmanship.

Some of the actions listed may require further NEPA analysis that would delay immediate implementation and response.

The appropriate land management agency local district or field offices would consider whether approval of pending authorizations within the affected adaptive management response area (lek, lek cluster or BSU) would exacerbate the population or habitat decline or would otherwise be inconsistent with the trigger responses. The land management agency would coordinate with appropriate federal, state and local agencies, and affected authorized land users for any action completed under this step.

In addition, the AMRT report would also identify an emergency/contingency plan that would outline immediate management actions that would take place, in the event the trigger is exacerbated. Such a plan should include goals, objectives, management actions and monitoring requirements developed specifically for the appropriate geographic area and/or populations being affected (e.g., lek, lek cluster, and/or BSU).

If a hard trigger is reached, district and/or field offices would implement the site specific actions outlined in the emergency/contingency response plan developed as part of the soft trigger response. If the hard trigger was reached, but not preceded by a soft trigger or the emergency/contingency response was not developed, the BLM (in coordination with Federal, State, and local partners) may implement temporary closures (in accordance with 43 CFR Part 8364.1, and as directed under BLM Instruction Memorandum No. 2013-035) to respond to a causal factor(s) that have resulted in a catastrophic event (i.e., wildfire). In addition, the BLM would no longer permit exceptions to allocation decisions in areas (e.g., lek, lek cluster, and/or BSU) that have reached a hard trigger and may delay issuance of new permits and authorizations until populations and/or habitat levels fall below the trigger threshold and the trigger has been determined to be reversed by the process outlined below (Longevity of Trigger Responses).

Management objectives in response to triggers would be SMART (Specific, Measurable, Achievable/Attainable, Relevant/Realistic, and Trackable/Timely or time specified).

Step 4-Implement Trigger Responses: The AMRT would submit the report to the appropriate land management agency's local district and/or field offices for implementation of specific management responses at the scale in which the trigger was reached (e.g., lek, lek cluster, and/or BSU), as contained in the report referenced in Steps 2 and 3.

Step 5-Monitor Responses: The AMRT with the appropriate land management agency's local district and/or field offices would continue to monitor (e.g., monitoring guidance within the Nevada Rangeland Monitoring Handbook, Stiver et al. 2015, etc.) the lek(s), lek cluster(s) and/or BSU(s) in which a trigger response is being applied to determine if the responses are adequately addressing the reason for the population and/or habitat decline. This information would be used in Step 1 above, "Assessment of GRSG Population and Habitat Conditions" the following year.

LONGEVITY OF TRIGGER RESPONSES (REMOVING THE TRIGGER RESPONSE)

The sub-regional technical team would work with the appropriate land management agency to develop criteria that would be used to evaluate whether a lek, lek cluster, and/or BSU that reached a trigger has recovered sufficiently or is trending in a positive direction. Longevity of a trigger response would be appropriate and apply to the type of management action being implemented.

Population and/or habitat triggers that resulted in management responses would be evaluated annually to determine their effectiveness. If implementation activities are successful or are improving populations or habitat conditions, these actions would be continued or re-prioritized by the AMRT using information from annual evaluation and monitoring.

For population and/or habitat trigger management responses that resulted in an allocation restriction, the federal land management agency would work with the AMRT to determine when a population or habitat trigger has been adequately addressed to remove the trigger response.

The process for evaluating population and habitat trigger responses may include, but are not limited to the following:

- Identification of upward population trends, based on an annual analysis of the GRSG state-spaced model (Coates et al. 2017 as updated).
- Response of vegetation communities and habitat following fire or other disturbance;
- Changes in GRSG HMAs based on periodic mapping updates;
- Evaluation of habitat or population responses based on an adaptive management process to determine what management actions are successful, what actions are unlikely to be successful and should be discontinued, what objectives should be modified to better reflect an achievable goal, and what actions should be changed to achieve the desired outcome;
- Evaluation of assessments completed following *the Sage-Grouse Habitat Assessment Framework: A Multiscale Assessment Tool*. Technical Reference 6710-1 (Stiver et al. 2015).
- In cases where efforts to improve habitat become infeasible (i.e., the area has passed an ecological threshold), the AMRT may decide to recommend removal of triggers.

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Appendix G

Fire and Invasives Assessment Tool

APPENDIX G
FIRE AND INVASIVES ASSESSMENT TOOL

In the Great Basin Region (WAFWA Management Zones III, IV, and V), the US Fish and Wildlife Service (2013) identified wildfire as a primary threat to Greater Sage-Grouse (GRSG) and its habitat. In particular, it identified wildfire in response to invasive annual grasses and conifer expansion. The Fire and Invasives Assessment Tool (FIAT) provides the BLM and other land management agencies with a framework for prioritizing wildfire management and GRSG habitat conservation.

Supported by US Forest Service General Technical Report 326 (Chambers et. al. 2014; see **Attachment 1**), FIAT provides the BLM and other agencies with a mechanism to identify and prioritize areas within GRSG habitat for potential treatment based on their resistance and resilience characteristics. In the cold desert ecosystem typical throughout the Great Basin, soil moisture and temperature fundamentally influence a landscape's ability to resist environmental change. These factors also influence the landscape's ability to be resilient after long-term ecosystem shifts following a disturbance event, such as wildfire. Low resistance and resilient landscapes are typically characterized by low elevations, south-facing slopes, and porous soils. These areas will likely respond differently to fuels management, wildfire, and subsequent rehabilitation compared to more resistant and resilient landscapes, such as those at higher elevations or on north-facing slopes.

At the resource management planning level, FIAT consists of the following parts:

- The identification of areas at the landscape level, based on national datasets and scientific literature, where the threat to GRSG and its habitat from conifer expansion and wildfire/invasive annual grass is highest
- The identification of regional and local areas where focused wildfire and habitat management is critical to GRSG conservation efforts
- The identification of overarching management strategies for conifer expansion and invasive annual grasses in the areas of habitat recovery/restoration, fuels management, fire operations, and post-fire rehabilitation/emergency stabilization and rehabilitation (ESR)

Attachment 2 outlines the FIAT landscape-level framework and describes the anticipated process for implementing the resource management strategies in the BLM district office and National Forest Unit.

Ultimately, the outcomes of the FIAT process will provide land managers with spatially defined priorities and management protocols for the following:

- Operational decision-making during fires
- Implementation of NEPA projects for invasive annual grass and conifer reduction, fuel breaks, and ESR efforts in GRSG habitat

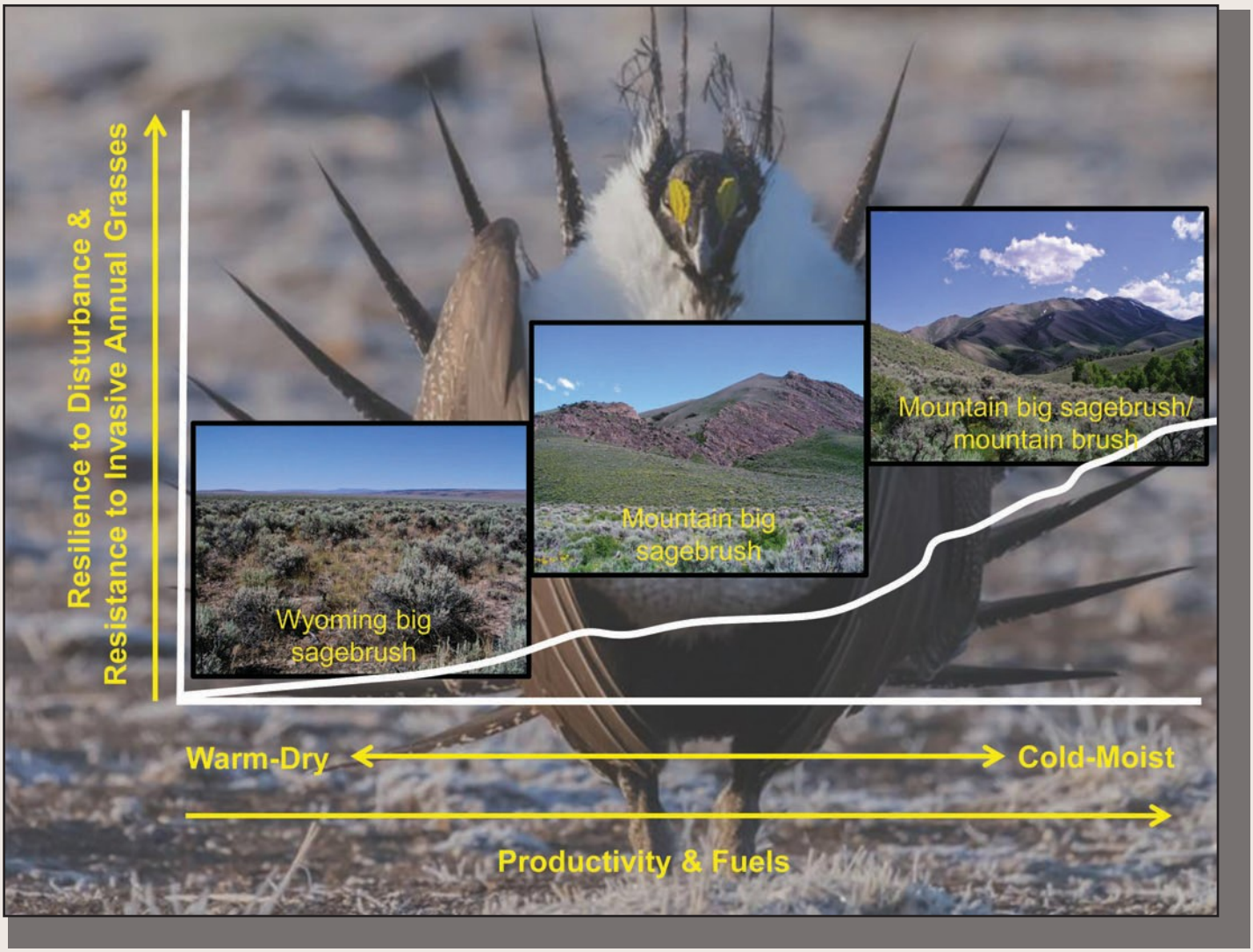
Attachment 1—Chambers et al. 2014 report

Attachment 2—Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessment

USDA United States Department of Agriculture

Using Resistance and Resilience Concepts to Reduce Impacts of Invasive Annual Grasses and Altered Fire Regimes on the Sagebrush Ecosystem and Greater Sage-Grouse: A Strategic Multi-Scale Approach

Jeanne C. Chambers, David A. Pyke, Jeremy D. Maestas, Mike Pellant, Chad S. Boyd, Steven B. Campbell, Shawn Espinosa, Douglas W. Havlina, Kenneth E. Mayer, and Amarina Wuenschel



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Abstract

This Report provides a strategic approach for conservation of sagebrush ecosystems and Greater Sage-Grouse (sage-grouse) that focuses specifically on habitat threats caused by invasive annual grasses and altered fire regimes. It uses information on factors that influence (1) sagebrush ecosystem resilience to disturbance and resistance to invasive annual grasses and (2) distribution, relative abundance, and persistence of sage-grouse populations to develop management strategies at both landscape and site scales. A sage-grouse habitat matrix links relative resilience and resistance of sagebrush ecosystems with sage-grouse habitat requirements for landscape cover of sagebrush to help decision makers assess risks and determine appropriate management strategies at landscape scales. Focal areas for management are assessed by overlaying matrix components with sage-grouse Priority Areas for Conservation (PACs), breeding bird densities, and specific habitat threats. Decision tools are discussed for determining the suitability of focal areas for treatment and the most appropriate management treatments.

Keywords: sagebrush habitat, Greater Sage-Grouse, fire effects, invasive annual grasses, management prioritization, conservation, prevention, restoration

Cover photos: *Greater Sage-grouse photo by Rick McEwan; sagebrush habitat photos by Jeanne Chambers.*

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Introduction

An unprecedented conservation effort is underway across 11 States in the western United States to reduce threats to Greater Sage-Grouse (*Centrocercus urophasianus*; hereafter, sage-grouse) and the sagebrush ecosystems on which they depend (fig. 1). Recent efforts were accelerated by the March 2010 determination that sage-grouse warrant protection under the Federal Endangered Species Act, and by increased emphasis on broad collaboration among state and Federal partners to proactively identify and implement actions to reverse current trends (USFWS 2010, 2013). Conservation success hinges on being able to achieve "the long-term conservation of sage-grouse and healthy sagebrush shrub and native perennial grass and forb communities by maintaining viable, connected, and well-distributed populations and habitats across their range, through threat amelioration, conservation of key habitats, and restoration activities" (USFWS 2013). While strides are being made to curtail a host of threats across the range, habitat loss and fragmentation due to wildfire and invasive plants remain persistent challenges to

Figure 1. Greater Sage-Grouse (*Centrocercus urophasianus*) (photo by Charlotte Ganskopp).

achieving desired outcomes – particularly in the western portion of the range (Miller et al. 2011; USFWS 2010; 2013). Management responses to date have not been able to match the scale of this problem. Natural resource managers are seeking coordinated approaches that focus appropriate management actions in the right places to maximize conservation effectiveness (Wisdom and Chambers 2009; Murphy et al. 2013).

Improving our ability to manage for resilience to disturbance and resistance to invasive species is fundamental to achieving long-term sage-grouse conservation objectives. Resilient ecosystems have the capacity to ***regain*** their fundamental structure, processes, and functioning when altered by stressors like drought and disturbances like inappropriate livestock grazing and altered fire regimes (Holling 1973; Allen et al. 2005). Species resilience refers to the ability of a species to recover from stressors and disturbances (USFWS 2013), and is closely linked to ecosystem resilience. Resistant ecosystems have the capacity to ***retain*** their fundamental structure, processes, and functioning when exposed to stresses, disturbances, or invasive species (Folke et al. 2004). Resistance to invasion by nonnative plants is increasingly important in sagebrush ecosystems; it is a function of the abiotic and biotic attributes and ecological processes of an ecosystem that limit the population growth of an invading species (D'Antonio and Thomsen 2004**)**. A detailed explanation of the factors that influence resilience and resistance in sagebrush ecosystems is found in Chambers et al. 2014.

In general, species are likely to be more resilient if large populations exist in large blocks of high quality habitat across the full breadth of environmental variability to which the species is adapted (Redford et al. 2011). Because sage-grouse are a broadly distributed and often wide-ranging species that may move long-distances between seasonal habitats (Connelly et al. 2011a,b), a strategic approach that integrates both landscape prioritization and site-scale decision tools is needed. This document develops such an approach for the conservation of sagebrush habitats across the range of sage-grouse with an emphasis on the western portion of the range. In recent years, information and tools have been developed that significantly increase our understanding of factors that influence the resilience of sagebrush ecosystems and the distribution of sage-grouse populations, and that allow us to strategically prioritize management activities where they are most likely to be effective and to benefit the species. Although the emphasis of this Report is on the western portion of the sage-grouse range, the approach has management applicability to other sagebrush ecosystems.

In this report, we briefly review causes and effects of invasive annual grasses and altered fire regimes, and then discuss factors that determine resilience to disturbances like wildfire and resistance to invasive annual grasses in sagebrush ecosystems. We illustrate how an understanding of resilience and resistance, sagebrush habitat requirements for sage-grouse, and consequences that invasive annual grasses and wildfire have on sage-grouse populations can be used to develop management strategies at both landscape and site scales. A sage-grouse habitat matrix is provided that links relative resilience and resistance with habitat requirements for landscape cover of sagebrush to both identify priority areas for management and determine effective management strategies at landscape scales. An approach for assessing focal areas for sage-grouse habitat management is described that overlays Priority Areas for Conservation (PACs) and breeding bird densities with resilience and resistance and habitat suitability to spatially link sage-grouse populations with habitat conditions and risks. The use of this approach is illustrated for the western portion of the range and for a diverse area in the northeast corner of Nevada. It concludes with a discussion of the tools available for determining the suitability of focal areas for treatment and the most appropriate management treatments. Throughout the document, the emphasis is on using this approach to guide and assist fire operations, fuels management, post-fire rehabilitation, and habitat restoration activities to maintain or enhance sage-grouse habitat.

Threats of Invasive Annual Grasses and Altered Fire Regimes to Sagebrush Ecosystems and Sage-Grouse

Effects on Sagebrush Ecosystems

Sage-grouse habitat loss and fragmentation due to wildfire and invasive plants are widely recognized as two of the most significant challenges to conservation of the species, particularly in the western portion of the range (Miller et al. 2011; USFWS 2010, 2013). During pre-settlement times, sagebrush-dominated ecosystems had highly variable fire return intervals that ranged from decades to centuries (Frost 1998; Brown and Smith 2000; Miller et al. 2011). At coarse regional scales, fire return intervals in sagebrush ecological types were determined largely by climate and its effects on fuel abundance and continuity. Consequently, fire frequency was higher in sagebrush types with greater productivity at higher elevations and following periods of increased precipitation than in lower elevation and less productive ecosystems (West 1983b; Mensing et al. 2006). At local scales within sagebrush types, fire return intervals likely were determined by topographic and soil effects on productivity and fuels and exhibited high spatial and temporal variability (Miller and Heyerdahl 2008).

Euro-American arrival in sagebrush ecosystems began in the mid-1800s and initiated a series of changes in vegetation composition and structure that altered fire regimes and resulted in major changes in sagebrush habitats. The first major change in fire regimes occurred when inappropriate grazing by livestock led to a decrease in native perennial grasses and forbs and effectively reduced the abundance of fine fuels (Knapp 1996; Miller and Eddleman 2001; Miller et al. 2011). Decreased competition from perennial herbaceous species, in combination with ongoing climate change and favorable conditions for woody species establishment at the turn of the twentieth century, resulted in increased abundance of shrubs (primarily *Artemisia* species) and trees, including juniper (*Juniperus occidentalis*, *J. osteosperma*) and piñon pine (*Pinus monophylla*), at mid to high elevations (Miller and Eddleman 2001; Miller et al. 2011). The initial effect of these changes in fuel structure was a reduction in fire frequency and size. The second major change in fire regimes occurred when non-native annual grasses (e.g., *Bromus tectorum, Taeniatherum caput-medusa*) were introduced from Eurasia in the late 1800s and spread rapidly into low to mid-elevation ecosystems with depleted understories (Knapp 1996). The invasive annual grasses increased the amount and continuity of fine fuels in many lower elevation sagebrush habitats and initiated annual grass/fire cycles characterized by shortened fire return intervals and larger, more contiguous fires (fig. 2; D'Antonio and Vitousek 1992; Brooks et al. 2004). Since settlement of the region, cheatgrass came to dominate as much as 4 million hectares (9.9 million acres) in the states of Nevada and Utah alone (fig. 3; Bradley and Mustard 2005). The final change in fire regimes occurred as a result of expansion of juniper and piñon pine trees into sagebrush types at mid to high elevations and a reduction of the grass, forb, and shrub species associated with these types. Ongoing infilling of trees is increasing woody fuels, but reducing fine fuels and resulting in less frequent fires (fig. 4; Miller et al. 2013). Extreme burning conditions (high winds, high temperatures, and low relative humidity) in high density (Phase III) stands are resulting in large and severe fires that result in significant losses of above- and below-ground organic matter (sensu Keeley 2009) and have detrimental ecosystem effects (Miller et al. 2013). Based on tree-ring analyses at several Great Basin sites, it is estimated that the extent of piñon and/or juniper woodland increased two to six fold since settlement, and most of that area will exhibit canopy closure within the next 50 years (Miller et al. 2008).

Figure 2. A wildfire that burned through a Wyoming big sagebrush ecosystem with an invasive annual grass understory in southern Idaho (top) (photo by Douglas J. Shinneman), and a close-up of a fire in a Wyoming big sagebrush ecosystem (bottom) (photo by Scott Schaff).

Figure 3. A wildfire that started in invasive annual grass adjacent to a railroad track and burned upslope into a mountain big sagebrush and Jeffrey pine ecosystem in northeast Nevada (top). A big sagebrush ecosystem that has been converted to invasive annual grass in north central Nevada (bottom) (photos by Nolan E. Preece).

Figure 4. Expansion of Utah juniper trees into a mountain big sagebrush ecosystem in east central Utah (top) that is resulting in progressive infilling of the trees and exclusion of native understory species (bottom) (photos by Bruce A. Roundy).

Effects on Sage-Grouse Habitat Selection and Population Dynamics

Understanding the effects of landscape changes on sage-grouse habitat selection and population dynamics can help managers apply more strategic and targeted conservation actions to reduce risks. Two key land cover shifts resulting from invasive annual grasses and altered fire regimes are affecting the ability to achieve the range-wide goal of stable-to-increasing population trends − large-scale reduction of sagebrush cover and conversion of sagebrush ecosystems to annual grasslands.

Sage-grouse are true sagebrush obligates that require large and intact sagebrush landscapes. Consequently, wildfires occurring at the extremes of the natural range of variability that remove sagebrush, even temporarily, over large areas and over short time periods often have negative consequences for sage-grouse. Several range-wide studies have identified the proportion of sagebrush-dominated land cover as a key indicator of sage-grouse population persistence and, importantly, have revealed critical levels of sagebrush landscape cover required by sage-grouse (see Appendix 2 for a description of landscape cover and how it is derived). Knick et al. (2013) found that 90% of active leks in the western portion of the range had more than 40% landscape cover of sagebrush within a 5-km (3.1-mi) radius of leks. Another range-wide analysis documented a high risk of extirpation with <27% sagebrush landscape cover and high probability of persistence with >50% sagebrush landscape cover within 18-km (11.2-mi) of leks (Wisdom et al. 2011). Similarly, Aldridge et al. (2008) found long-term sage-grouse persistence required a minimum of 25%, and preferably at least 65%, sagebrush landscape cover at the 30-km (18.6-mi) scale. Considered collectively, cumulative disturbances that reduce the cover of sagebrush to less than a quarter of the landscape have a high likelihood of resulting in local population extirpation, while the probability of maintaining persistent populations goes up considerably as the proportion of sagebrush cover exceeds two-thirds or more of the landscape. Reduction of sagebrush cover is most critical in low to mid elevations where natural recovery of sagebrush can be very limited within timeframes important to sage-grouse population dynamics (Davies et al. 2011).

Nonnative annual grasses and forbs have invaded vast portions of the sage-grouse range, reducing both habitat quantity and quality (Beck and Mitchell 2000; Rowland et al. 2006; Miller et al. 2011; Balch et al. 2013). Due to repeated fires, some low- to mid-elevation native sagebrush communities are shifting to novel annual grassland states resulting in habitat loss that may be irreversible with current technologies (Davies et al. 2011; Miller et al. 2011; Chambers et al. 2014). At the broadest scales, the presence of non-native annual grasslands on the landscape may be influencing both sage-grouse distribution and abundance. In their analysis of active leks, Knick et al. (2013) found that most leks had very little annual grassland cover (2.2%) within a 5-km (3.1-mi) radius of the leks; leks that were no longer used had almost five times as much annual grassland cover as active leks. Johnson et al. (2011) found that lek use became progressively less as the cover of invasive annual species increased at both the 5-km (3.1-mi) and 18-km (11.2-mi) scales. Also, few leks had >8% invasive annual vegetation cover within both buffer distances.

Patterns of nest site selection also suggest local impacts of invasive annual grasses on birds. In western Nevada, Lockyer (2012) found that sage-grouse selected large expanses of sagebrush-dominated areas and, within those areas, sage-grouse selected microsites with higher shrub canopy cover and lower cheatgrass cover. Average cheatgrass cover at selected locations was 7.1% compared to 13.3% at available locations. Sage-grouse hens essentially avoided nesting in areas with higher cheatgrass cover. Kirol et al. (2012) also found nest-site selection was negatively correlated with the presence of cheatgrass in south-central Wyoming.

Sage-grouse population demographic studies in northern Nevada show that recruitment and annual survival also are affected by presence of annual grasslands at larger scales. Blomberg et al. (2012) analyzed land cover within a 5-km (3.1-mi) radius of leks and found that leks impacted by annual grasslands experienced lower recruitment than non-impacted leks, even following years of high precipitation. Leks that were not affected by invasive annual grasslands exhibited recruitment rates nearly twice as high as the population average and nearly six times greater than affected leks during years of high precipitation.

Piñon and juniper expansion at mid to upper elevations into sagebrush ecosystems also has altered fire regimes and reduced sage-grouse habitat availability and suitability over large areas with population-level consequences (Miller et al. 2011; Baruch-Mordo et al. 2013; Knick et al. 2013). Conifer expansion results in non-linear declines in sagebrush cover and reductions in perennial native grasses and forbs as conifer canopy cover increases (Miller et al. 2000) and this has direct effects on the amount of available habitat for sagebrush-obligate species. Sites in the late stage of piñon and juniper expansion and infilling (Phase III from Miller et al. 2005) have reduced fire frequency (due to decreased fine fuels), but are prone to higher severity fires (due to increased woody fuels) which significantly reduces the likelihood of sagebrush habitat recovery (fig. 5) (Bates et al. 2013). Even before direct habitat loss occurs, sage-grouse avoid or are negatively associated with conifer cover during all life stages (i.e., nesting, brood-rearing, and wintering; Doherty et al. 2008, 2010a; Atamian et al. 2010; Casazza et al. 2011). Also, sage-grouse incur population-level impacts at a very low level of conifer encroachment. The ability to maintain active leks is severely compromised when conifer canopy exceeds 4% in the immediate vicinity of the lek (Baruch-Mordo et al. 2013), and most active leks average less than 1% conifer cover at landscape scales (Knick et al. 2013).

Figure 5. A post-burn, Phase III, singleleaf piñon and Utah juniper dominated sagebrush ecosystem in which soils are highly erosive and few understory plants remain (photo by Jeanne C. Chambers).

Resilience to Disturbance and Resistance to Invasive Annual Grasses in Sagebrush Ecosystems

Our ability to address the changes occurring in sagebrush habitats can be greatly enhanced by understanding the effects of environmental conditions on resilience to stress and disturbance, and resistance to invasion (Wisdom and Chambers 2009; Brooks and Chambers 2011; Chambers et al. 2014). In cold desert ecosystems, resilience of native ecosystems to stress and disturbance changes along climatic and topographic gradients. In these ecosystems, Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*), mountain big sagebrush (*A. t.* spp. *vaseyana*), and mountain brush types (e.g., mountain big sagebrush, snowberry [*Symphorocarpus* spp.], bitterbrush [*Purshia tridentata*]) occur at progressively higher elevations and are associated with decreasing temperatures and increasing amounts of precipitation, productivity, and fuels (fig. 6; West and Young 2000). Piñon pine and juniper woodlands are typically associated with mountain big sagebrush types, but can occur with relatively cool and moist Wyoming big sagebrush types and warm and moist mountain brush types (Miller et al. 2013). Resilience to disturbance, including wildfire, has been shown to increase along these elevation gradients (fig. 7A) (Condon et al. 2011; Davies et al. 2012; Chambers et al. 2014; Chambers et al. *in press*). Higher precipitation and cooler temperatures, coupled with greater soil development and plant productivity at mid to high elevations, can result in greater resources and more favorable environmental conditions for plant growth and reproduction (Alexander et al. 1993; Dahlgren et al. 1997). In contrast, minimal precipitation and high temperatures at low elevations result in lower resource availability for plant growth (West 1983a,b;

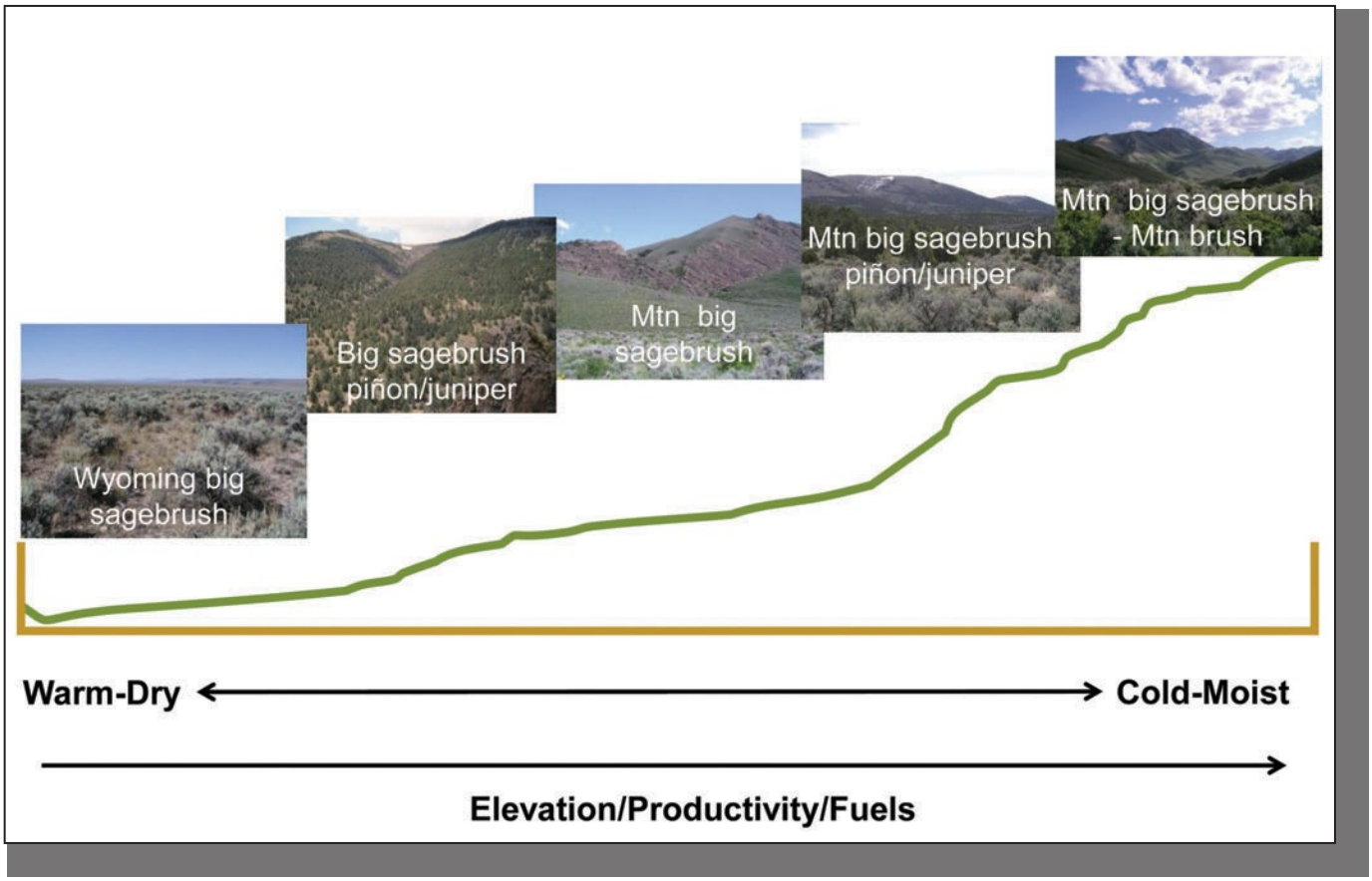

Figure 6. The dominant sagebrush ecological types that occur along environmental gradients in the western United States. As elevation increases, soil temperature and moisture regimes transition from warm and dry to cold and moist and vegetation productivity and fuels become higher.

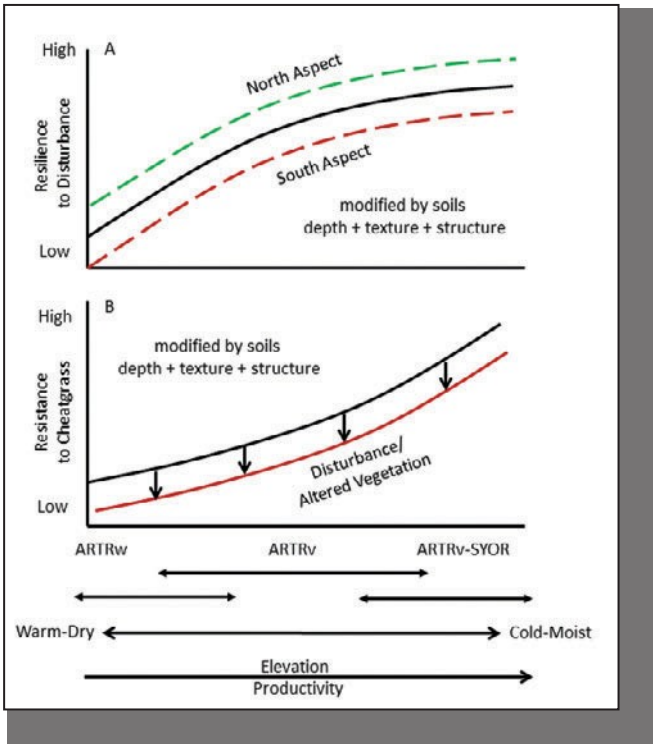

Figure 7. (**A)** Resilience to disturbance and (**B)** resistance to cheatgrass over a typical temperature/precipitation gradient in the cold desert. Dominant ecological sites occur along a continuum that includes Wyoming big sagebrush on warm and dry sites, to mountain big sagebrush on cool and moist sites, to mountain big sagebrush and root-sprouting shrubs on cold and moist sites. Resilience increases along the temperature/precipitation gradient and is influenced by site characteristics like aspect. Resistance also increases along the temperature/precipitation gradient and is affected by disturbances and management treatments that alter vegetation structure and composition and increase resource availability (modified from Chambers et al. 2014; Chambers et al. *in press*).

Smith and Nowak 1990). These relationships also are observed at local plant community scales where aspect, slope, and topographic position affect solar radiation, erosion processes, effective precipitation, soil development and vegetation composition and structure (Condon et al. 2011; Johnson and Miller 2006).

Resistance to invasive annual grasses depends on environmental factors and ecosystem attributes and is a function of (1) the invasive species' physiological and life history requirements for establishment, growth, and reproduction, and (2) interactions with the native perennial plant community including interspecific competition and response to herbivory and pathogens. In cold desert ecosystems, resistance is strongly influenced by soil temperature and moisture regimes (Chambers et al. 2007; Meyer et al. 2001). Germination, growth, and/or reproduction of cheatgrass is physiologically limited at low elevations by frequent, low precipitation years, constrained at high elevations by low soil temperatures, and optimal at mid elevations under relatively moderate temperature and water availability (fig. 7B; Meyer et al. 2001; Chambers et al. 2007). Slope, aspect, and soil characteristics modify soil temperature and moisture and influence resistance to cheatgrass at landscape to plant community scales (Chambers et al. 2007; Condon et al. 2011; Reisner et al. 2013). Genetic variation in cheatgrass results in phenotypic traits that increase survival and persistence in populations from a range of environments, and is likely contributing to the recent range expansion of this highly inbreeding species into marginal habitats (Ramakrishnan et al. 2006; Merrill et al. 2012).

The occurrence and persistence of invasive annual grasses in sagebrush habitats is strongly influenced by interactions with the native perennial plant community (fig. 7B). Cheatgrass, a facultative winter annual that can germinate from early fall through early spring, exhibits root elongation at low soil temperatures, and has higher nutrient uptake and growth rates than most native species (Mack and Pyke 1983; Arredondo et al. 1998; James et al. 2011). Seedlings of native, perennial plant species are generally poor competitors with cheatgrass, but adults of native, perennial grasses and forbs, especially those with similar growth forms and phenology, can be highly effective competitors with the invasive annual (Booth et al. 2003; Chambers et al. 2007; Blank and Morgan 2012).

Also, biological soil crusts, which are an important component of plant communities in warmer and drier sagebrush ecosystems, can reduce germination or establishment of cheatgrass (Eckert et al. 1986; Kaltenecker et al. 1999). Disturbances or management treatments that reduce abundance of native perennial plants and biological soil crusts and increase the distances between perennial plants often are associated with higher resource availability and increased competitive ability of cheatgrass (Chambers et al. 2007; Reisner et al. 2013; Roundy et al. *in press*).

The type, characteristics, and natural range of variability of stress and disturbance strongly influence both resilience and resistance (Jackson 2006). Disturbances like overgrazing of perennial plants by livestock, wild horses, and burros and more frequent or more severe fires are typically outside of the natural range of conditions and can reduce the resilience of sagebrush ecosystems. Reduced resilience is triggered by changes in environmental factors like temperature regimes, abiotic attributes like water and nutrient availability, and biotic attributes such as vegetation structure, composition, and productivity (Chambers et al. 2014) and cover of biological soil crusts (Reisner et al. 2013). Resistance to an invasive species can change when changes in abiotic and biotic attributes result in increased resource availability or altered habitat suitability that influences an invasive species' ability to establish and persist and/or compete with native species. Progressive losses of resilience and resistance can result in the crossing of abiotic and/or biotic thresholds and an inability of the system to recover to the reference state (Beisner et al. 2003; Seastedt et al. 2008).

Interactions among disturbances and stressors may have cumulative effects (Chambers et al. 2014). Climate change already may be shifting fire regimes outside of the natural range of occurrence (i.e., longer wildfire seasons with more frequent and longer duration wildfires) (Westerling et al. 2006). Sagebrush ecosystems generally have low productivity, and the largest number of acres burned often occurs a year or two after warm, wet conditions in winter and spring that result in higher fine fuel loads (Littell et al. 2009). Thus, annual grass fire cycles may be promoted by warm, wet winters and a subsequent increase in establishment and growth of invasive winter annuals. These cycles may be exacerbated by rising atmospheric CO_2 concentrations, N deposition, and increases in human activities that result in soil surface disturbance and invasion corridors (Chambers et al. 2014). Modern deviations from historic conditions will likely continue to alter disturbance regimes and sagebrush ecosystem response to disturbances; thus, management strategies that rely on returning to historical or "pre-settlement" conditions may be insufficient, or even misguided, given novel ecosystem dynamics (Davies et al. 2009).

Integrating Resilience and Resistance Concepts With Sage-Grouse Habitat Requirements to Manage Wildfire and Invasive Annual Grass Threats at Landscape Scales

The changes in sagebrush ecosystem dynamics due to invasive annual species and longer, hotter, and drier fire seasons due to a warming climate make it unlikely that these threats can be ameliorated completely (Abatzoglou and Kolden 2011; USFWS 2013). Consequently, a strategic approach is necessary to conserve sagebrush habitat and sage-grouse (Wisdom et al. 2005; Meinke et al. 2009; Wisdom and Chambers 2009; Pyke 2011). This strategic approach requires the ability to (1) identify those locations that provide current or potential habitat for sage-grouse and (2) prioritize management actions based on the capacity of the ecosystem to respond in the desired manner and to effectively allocate resources to achieve desired objectives. Current understanding of the relationship of landscape cover of sagebrush to sage-grouse habitat provides the capacity to identify those locations on the landscape that have a high probability of

sage-grouse persistence (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). Similarly, knowledge of the relationships of environmental characteristics, specifically soil temperature and moisture regimes, to ecological types and their inherent resilience and resistance gives us the capacity to prioritize management actions based on probable effectiveness of those actions (Wisdom and Chambers 2009; Brooks and Chambers 2011; Miller et al. 2013; Chambers et al. 2014; Chambers et al. *in press,*).

In this section, we discuss the use of landscape cover of sagebrush as an indicator of sage-grouse habitat, and the use of soil temperature and moisture regimes as an indicator of resilience to disturbance, resistance to invasive annual grasses and, ultimately, the capacity to achieve desired objectives. We then show how these two concepts can be coupled in a sage-grouse habitat matrix and used to determine potential management strategies at the landscape scales on which sage-grouse depends.

Landscape Cover of Sagebrush as an Indicator of Sage-Grouse Habitat

Landscape cover of sagebrush is closely related to the probability of maintaining active sage-grouse leks, and is used as one of the primary indicators of sage-grouse habitat potential at landscape scales (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). Landscape cover of sagebrush less than about 25% has a low probability of sustaining active sage-grouse leks (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). Above 25% landscape cover of sagebrush, the probability of maintaining active sage-grouse leks increases with increasing sagebrush landscape cover. At landscape cover of sagebrush ranging from 50 to 85%, the probability of sustaining sage-grouse leks becomes relatively constant (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). For purposes of prioritizing landscapes for sage-grouse habitat management, we use 25% as the level below which there is a low probability of maintaining sage-grouse leks and 65% as the level above which there is little additional increase in the probability of sustaining active leks with further increases of landscape cover of sagebrush (fig. 8; Knick et al. 2013). Between about 25% and 65% landscape sagebrush cover, increases in landscape cover of sagebrush have a constant positive relationship with sage-grouse lek probability (fig. 8; Knick et al. 2013). Restoration and management activities that result in an increase in the amount of sagebrush dominated landscape within areas of pre-existing landscape cover between 25% and 65% likely will result in a higher probability of sage-grouse persistence, while declines in landscape cover of sagebrush likely will result in reductions in sage-grouse (Knick et al. 2013). It is important to note that

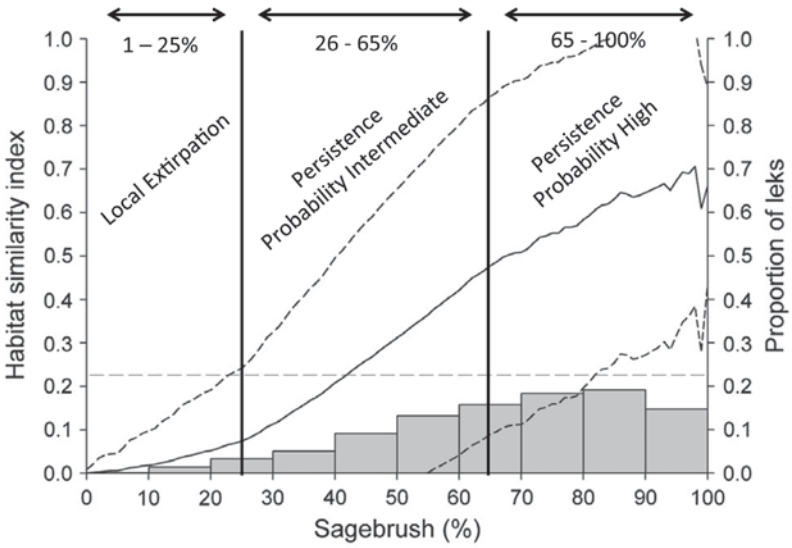

Figure 8. The proportion of sage-grouse leks and habitat similarity index (HSI) as related to the percent landscape cover of sagebrush. The HSI indicates the relationship of environmental variables at map locations across the western portion of the range to minimum requirements for sage-grouse defined by land cover, anthropogenic variables, soil, topography, and climate. HSI is the solid black line ± 1 SD (stippled lines). Proportion of leks are the grey bars. Dashed line indicates HSI values above which characterizes 90% of active leks (0.22). The categories at the top of the figure and the interpretation of lek persistence were added based on Aldridge et al. 2008; Wisdom et al. 2011; and Knick et al. 2013 (figure modified from Knick et al. 2013).

these data and interpretations relate only to persistence (i.e., whether or not a lek remains active) and it is likely that higher proportions of sagebrush cover or improved condition of sagebrush ecosystems may be required for population growth.

For the purposes of delineating sagebrush habitat relative to sage-grouse requirements for landscape cover of sagebrush, we calculated the percentage landscape sagebrush cover within each of the selected categories (1-25%, 26-65%, >65%) for the range of sage-grouse (fig. 9, 10). An explanation of how landscape cover of sagebrush is derived is in Appendix 2. Large areas of landscape sagebrush cover >65% are found primarily in Management Zones (MZ) II (Wyoming Basin), IV (Snake River Plains), and V (Northern Great Basin). In contrast, relatively small areas of landscape sagebrush cover >65% are located in MZ I (Great Plains), III (Southern Great Basin), VI (Columbia Basin), and VII (Colorado Plateau). Sagebrush is naturally less common in the Great Plains region compared to other parts of the range and previous work suggested that sage-grouse populations in MZ I may be more vulnerable to extirpation with further reductions in sagebrush cover (Wisdom et al. 2011). In the western portion of the range, where the threat of invasive annual grasses and wildfire is greatest, the area of sagebrush cover >65% differs among MZs. MZ III is a relatively arid and topographically diverse area in which the greatest extent of sagebrush cover >65% is in higher elevation, mountainous areas. MZs IV and V have relatively large extents of sagebrush cover >65% in relatively cooler and wetter areas, and MZs IV and VI have lower extents of sagebrush cover >65% in warmer and dryer areas and in areas with significant agricultural development. These differences in landscape cover of sagebrush indicate that different sets of management strategies may apply to the various MZs.

Soil Temperature and Moisture Regimes as Indicators of Ecosystem Resilience and Resistance

Potential resilience and resistance to invasive annual grasses reflect the biophysical conditions that an area is capable of supporting. In general, the highest potential resilience and resistance occur with ***cool*** to ***cold*** (frigid to cryic) soil temperature regimes and relatively ***moist*** (xeric to ustic) soil moisture regimes, while the lowest potential resilience and resistance occur with ***warm*** (mesic) soil temperatures and relatively ***dry*** (aridic) soil moisture regimes (Chambers et al. 2014, Chambers et al. *in press*). Definitions of soil temperature and moisture regimes are in Appendix 3. Productivity is elevated by high soil moisture and thus resilience is increased (Chambers et al. 2014); annual grass growth and reproduction is limited by cold soil temperatures and thus resistance is increased (Chambers et al. 2007). The timing of precipitation also is important because cheatgrass and many other invasive annual grasses are particularly well-adapted to Mediterranean type climates with cool and wet winters and warm and dry summers (Bradford and Lauenroth 2006; Bradley 2009). In contrast, areas that receive regular summer precipitation (ustic soil moisture regimes) often are dominated by warm and/or cool season grasses (Sala et al. 1997) that likely create a more competitive environment and result in greater resistance to annual grass invasion and spread (Bradford and Lauenroth 2006; Bradley 2009).

Much of the remaining sage-grouse habitat in MZs I (Great Plains), II (Wyoming Basin), VII (Colorado Plateau), and cool-to-cold or moist sites scattered across the range, are characterized by moderate to high resilience and resistance as indicated by soil temperature and moisture regimes (fig. 11). Sagebrush habitats across MZ I are unique from a range-wide perspective because soils are predominantly cool and ustic, or bordering on ustic as a result of summer precipitation; this soil moisture regime appears to result in higher resilience and resistance (Bradford and Lauenroth 2006).

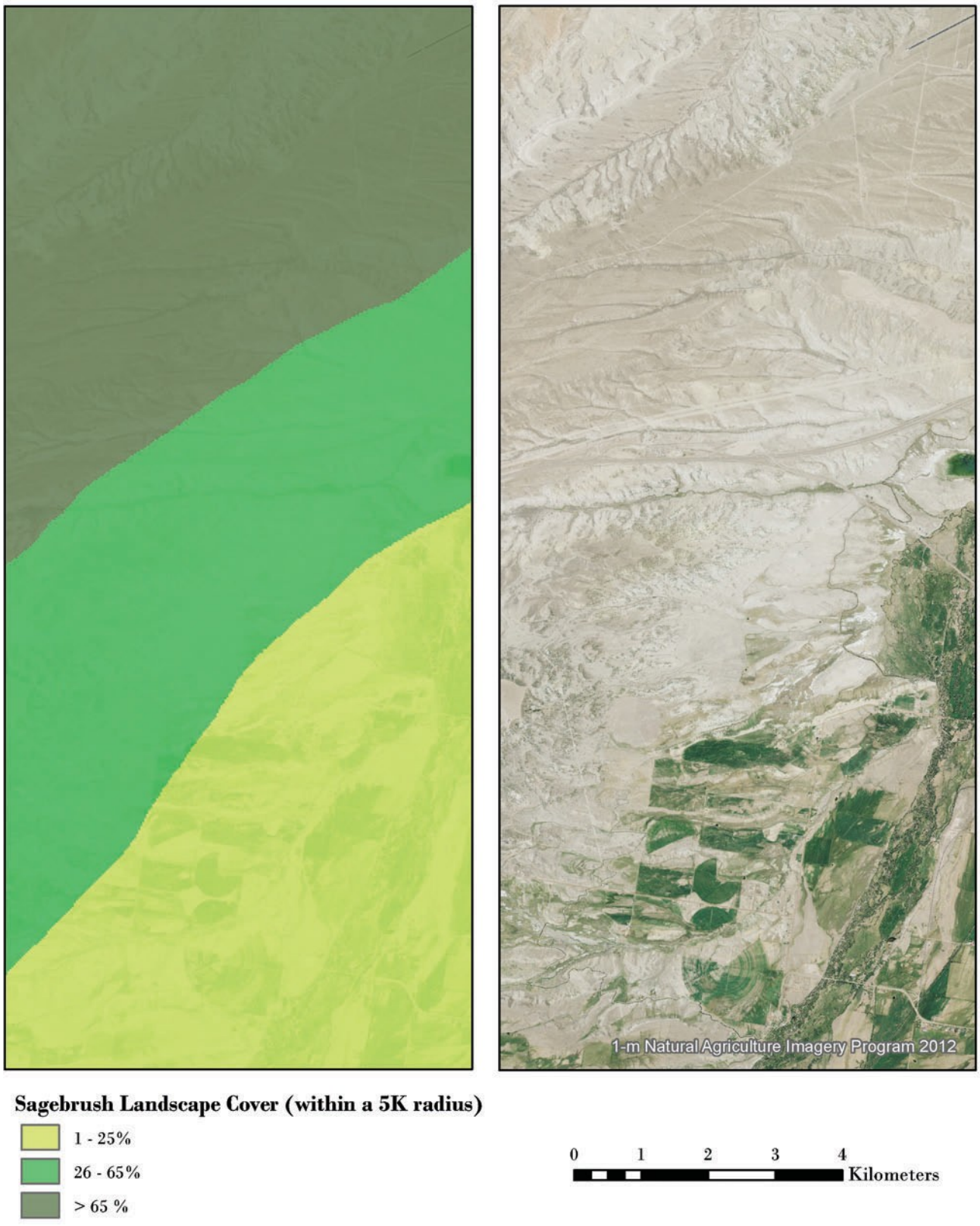

Figure 9. Landscape cover of sagebrush from 1-m National Agricultural Imagery (right) and the corresponding sagebrush landscape cover for the 1-25%, 26-65%, and >65% categories (left). See Appendix 2 for an explanation of how the categories are determined.

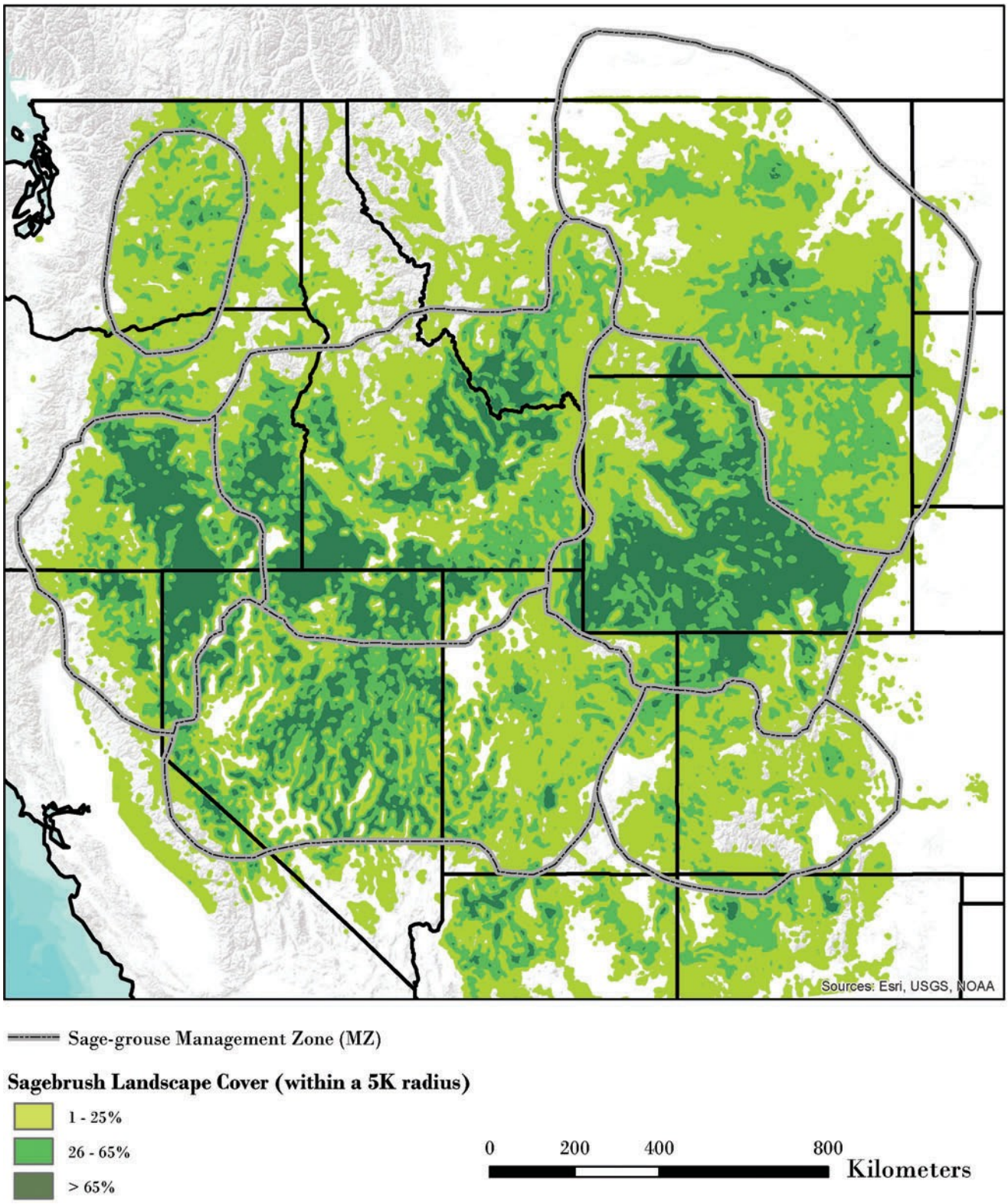

Figure 10. The landscape cover of sagebrush within each of three selected categories (1-25%, 26-65%, >65%) for the range of sage-grouse (Management Zones I – VII; Stiver et al. 2006). The proportion of sagebrush (USGS 2013) within each of the categories in a 5-km (3.1-mi) radius surrounding each pixel was calculated relative to other land cover types for locations with sagebrush cover.

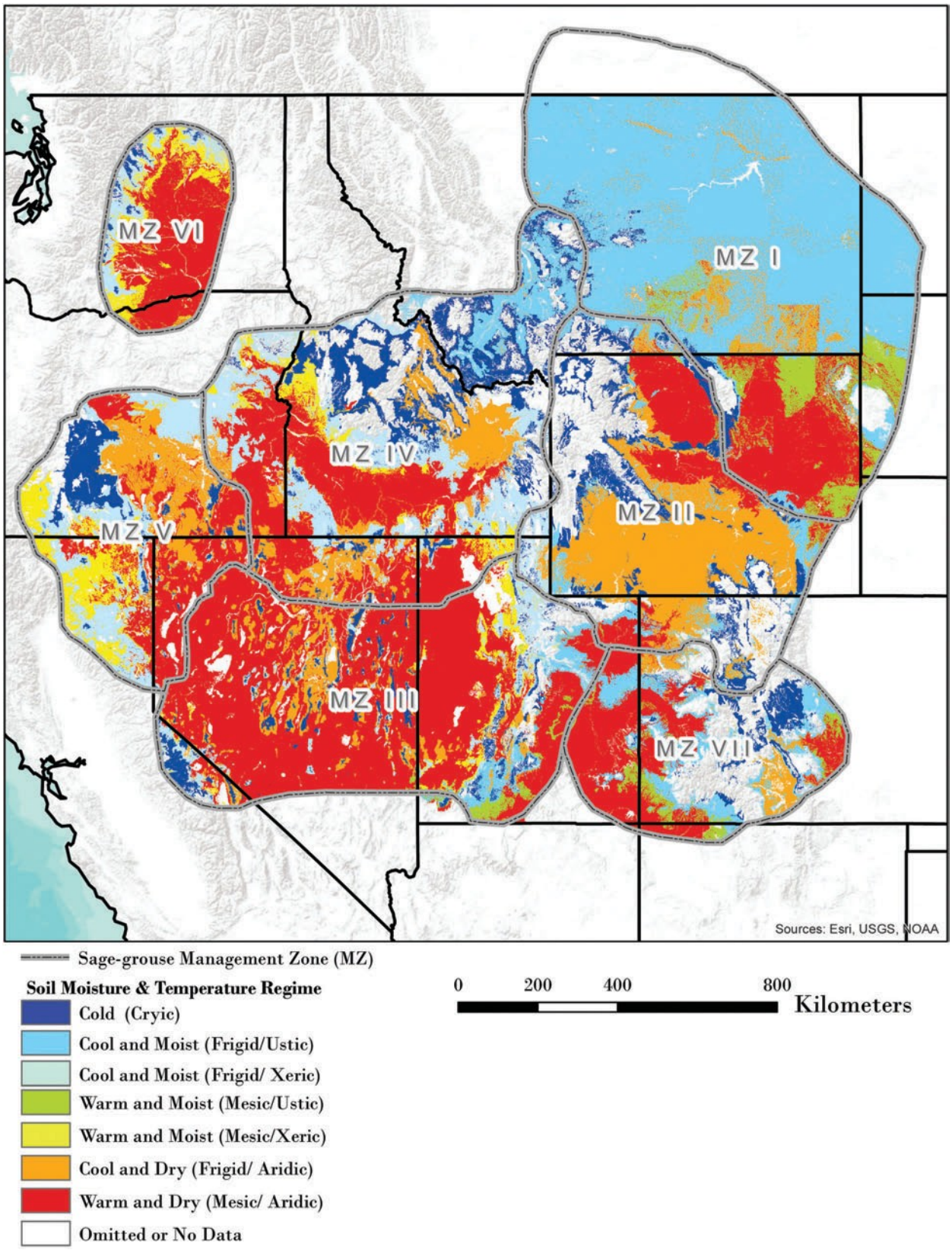

Figure 11. The soil temperature and moisture regimes for the range of sage-grouse (Management Zones I – VII; Stiver et al. 2006). Soil temperature and moisture classes were derived from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) (Soil Survey Staff 2014a). Gaps in that dataset were filled in with the NRCS State Soil Geographic Database (STATSGO) (Soil Survey Staff 2014b).

However, significant portions of MZs III (Southern Great Basin), much of IV (Snake River Plains), V (Northern Great Basin), and VI (Columbia Basin) are characterized largely by either warm and dry, or warm to cool and moist ecological types with moderate to low resilience and resistance (fig. 11; table 1). Areas within these MZs that have warm and dry soils are typically characterized by Wyoming big sagebrush ecosystems with low to moderately low resilience and resistance and are currently of greatest concern for sage-grouse conservation (fig. 12A). Areas with warm to cool soil temperature regimes and moist precipitation regimes are typically characterized by either Wyoming or mountain big sagebrush, have moderate to moderately low resilience and resistance,

Table 1. Predominant sagebrush ecological types in Sage-Grouse Management Zones III, IV, V, and VI based on soil temperature and soil moisture regimes, typical characteristics, and resilience to disturbance and resistance to invasive annual grasses (modified from Miller et al. 2014 a,b). Relative abundance of sagebrush species and composition of understory vegetation vary depending on Major Land Resource Area and ecological site type.

Ecological type	Characteristics	Resilience and resistance
Cold and Moist (Cryic/Xeric)	Ppt: 14 inches + Typical shrubs: *Mountain big sagebrush, snowfield sagebrush, snowberry, serviceberry, silver sagebrush, and/or low sagebrushes*	*Resilience* – **Moderately high**. Precipitation and productivity are generally high. Short growing seasons can decrease resilience on coldest sites. *Resistance*– **High**. Low climate suitability to invasive annual grasses
Cool and Moist (Frigid/Xeric)	Ppt: 12-22 inches Typical shrubs: *Mountain big sagebrush, antelope bitterbrush, snowberry, and/or low sagebrushes* Piñon pine and juniper potential in some areas	*Resilience* – **Moderately high**. Precipitation and productivity are generally high. Decreases in site productivity, herbaceous perennial species, and ecological conditions can decrease resilience. *Resistance* – **Moderate**. Climate suitability to invasive annual grasses is moderate, but increases as soil temperatures increase.
Warm and Moist (Mesic/Xeric)	Ppt: 12-16 inches Typical shrubs: *Wyoming big sagebrush, mountain big sagebrush, Bonneville big sagebrush, and/or low sagebrushes* Piñon pine and juniper potential in some areas	*Resilience* – **Moderate**. Precipitation and productivity are moderately high. Decreases in site productivity, herbaceous perennial species, and ecological conditions can decrease resilience. *Resistance* – **Moderately low**. Climate suitability to invasive annual grasses is moderately low, but increases as soil temperatures increase.
Cool and Dry (Frigid/Aridic)	Ppt: 6-12 inches Typical shrubs: *Wyoming big sagebrush, black sagebrush, and/or low sagebrushes*	*Resilience* – **Low**. Effective precipitation limits site productivity. Decreases in site productivity, herbaceous perennial species, and ecological conditions further decrease resilience. *Resistance* – **Moderate**. Climate suitability to invasive annual grasses is moderate, but increases as soil temperatures increase.
Warm and Dry (Mesic/Aridic, bordering on Xeric)	Ppt: 8-12 inches Typical shrubs: *Wyoming big sagebrush, black sagebrush and/or low sagebrushes*	*Resilience* – **Low.** Effective precipitation limits site productivity. Decreases in site productivity, herbaceous perennial species, and ecological conditions further decrease resilience. Cool season grasses susceptibility to grazing and fire, along with hot dry summer fire conditions, promote cheatgrass establishment and persistence. *Resistance* – **Low.** High climate suitability to cheatgrass and other invasive annual grasses. Resistance generally decreases as soil temperature increases, but establishment and growth are highly dependent on precipitation.

and have the potential for piñon and juniper expansion (Miller et al. 2014a; Chambers et al. *in press*). Many of these areas also are of conservation concern because piñon and juniper expansion and tree infilling can result in progressive loss of understory species and altered fire regimes (Miller et al. 2013). In contrast, areas with cool to cold soil temperature regimes and moist precipitation regimes have moderately high resilience and high resistance and are likely to recover in a reasonable amount of time following wildfires and other disturbances (Miller et al. 2013) (fig. 12B)

Figure 12. A Wyoming big sagebrush ecosystem with warm and dry soils in southeast Oregon (top) (photo by Richard F. Miller), compared to a mountain big sagebrush ecosystem with cool and moist soils in central Nevada (bottom) (photo by Jeanne C. Chambers).

Management Strategies Based on Landscape Cover of Sagebrush and Ecosystem Resilience and Resistance: The Sage-Grouse Habitat Matrix

Knowledge of the potential resilience and resistance of sagebrush ecosystems can be used in conjunction with sage-grouse habitat requirements to determine priority areas for management and identify effective management strategies at landscape scales (Wisdom and Chambers 2009). The sage-grouse habitat matrix (table 2) illustrates the relative resilience to disturbance and resistance to invasive annual grasses of sagebrush ecosystems in relation to the proportion of sagebrush cover on the landscape. As resilience and resistance go from high to low, as indicated by the rows in the matrix, decreases in sagebrush regeneration and abundance of perennial grasses and forbs progressively limit the capacity of a sagebrush ecosystem to recover after fire or other disturbances. The risk of annual invasives increases and the ability to successfully restore burned or otherwise disturbed areas decreases. As sagebrush cover goes from low to high within these same ecosystems, as indicated by the columns in the matrix, the capacity to provide adequate habitat cover for sage-grouse increases. Areas with less than 25% landscape cover of sagebrush are unlikely to provide adequate habitat for sage-grouse; areas with 26-65% landscape cover of sagebrush can provide habitat for sage-grouse but are at risk if sagebrush loss occurs without recovery; and areas with >65% landscape cover of sagebrush provide the necessary habitat conditions for sage-grouse to persist. Potential landscape scale management strategies can be determined by considering (1) resilience to disturbance, (2) resistance to invasive annuals, and (3) sage-grouse land cover requirements. Overarching management strategies to maintain or increase sage-grouse habitat at landscape scales based on these considerations are conservation, prevention, restoration, and monitoring and adaptive management (table 3; see Chambers et al. 2014). These strategies have been adapted for each of the primary agency programs including fire operations, fuels management, post-fire rehabilitation, and habitat restoration (table 4). Because sagebrush ecosystems occur over continuums of environmental conditions, such as soil temperature and moisture, and have differing land use histories and species composition, careful assessment of the area of concern always will be necessary to determine the relevance of a particular strategy (Pyke 2011; Chambers et al. 2014; Miller et al. 2014 a, b). The necessary information for conducting this type of assessment is found in the "Putting It All Together" section of this report.

Although the sage-grouse habitat matrix (table 2) can be viewed as partitioning land units into spatially discrete categories (i.e., landscapes or portions thereof can be categorized as belonging to one of nine categories), it is not meant to serve as a strict guide to spatial allocation of resources or to prescribe specific management strategies. Instead, the matrix should serve as a decision support tool for helping managers implement strategies that consider both the resilience and resistance of the landscape and landscape sagebrush cover requirements of sage-grouse. For example, low elevation Wyoming big sagebrush plant communities with relatively low resilience and resistance may provide important winter habitat resources for a given sage-grouse population. In a predominantly Wyoming big sagebrush area comprised of relatively low sagebrush landscape cover, a high level of management input may be needed to realize conservation benefits for sage-grouse. This doesn't mean that management activities should not be undertaken if critical or limiting sage-grouse habitat resources are present, but indicates that inputs will be intensive, potentially more expensive, and less likely to succeed relative to more resilient landscapes. It is up to the user of the matrix to determine how such tradeoffs influence management actions.

Table 2. Sage-grouse habitat matrix based on resilience and resistance concepts from Chambers et al. 2014, and sage-grouse habitat requirements from Aldridge et al. 2008, Wisdom et al. 2011, and Knick et al. 2013. Rows show the ecosystems relative resilience to disturbance and resistance to invasive annual grasses derived from the sagebrush ecological types in table 1 (1 = high resilience and resistance; 2 = moderate resilience and resistance; 3 = low resilience and resistance). Columns show the current proportion of the landscape (5-km rolling window) dominated by sagebrush (A = 1-25% land cover; B = 26-65% land cover; 3 = >65% land cover). Use of the matrix is explained in text. Overarching management strategies that consider resilience and resistance and landscape cover of sagebrush are in table 3. Potential management strategies specific to agency program areas, including fire operations, fuels management, post-fire rehabilitation, and habitat restoration are in table 4.

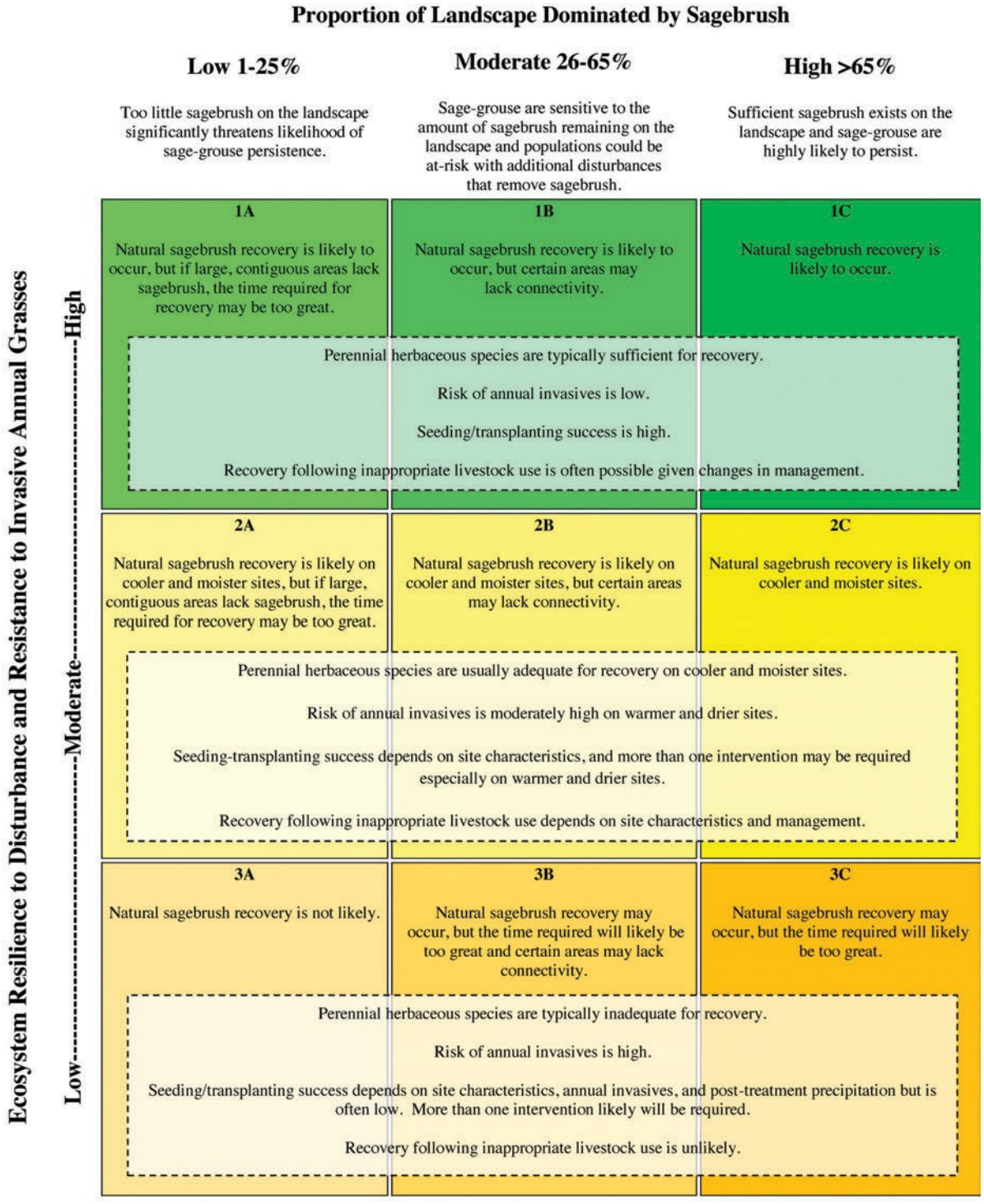

Table 3. Potential management strategies based on resilience to disturbance, resistance to annual grass invasion, and sage-grouse habitat requirements based on Aldridge et al. 2008; Wisdom et al. 2011; and Knick et al. 2013 (adapted from Chambers et al. 2014).

Conserve – maintain or increase resilience to disturbance and resistance to invasive annuals in areas with high conservation value	
Priorities	• Ecosystems with low to moderate resilience to fire and resistance to invasive species that still have large patches of landscape sagebrush cover and adequate perennial grasses and forbs – *ecological types with warm and dry and cool and dry soil temperature/moisture regimes.* • Ecosystems with a high probability of providing habitat for sage-grouse, especially those with >65% landscape cover of sagebrush and adequate perennial herbaceous species – *all ecological types.*
Objective	• Minimize impacts of current and future human-caused disturbances and stressors.
Activities	• Immediately suppress fire in moderate to low resilience and resistance sagebrush and wooded shrublands to prevent an invasive annual grass-fire cycle. Large sagebrush patches are high priority for protection from wildfires. • Implement strategic fuel break networks to provide anchor points for suppression and reduce losses when wildfires escape initial attack. • Manage livestock grazing to prevent loss of perennial native grasses and forbs and biological soil crusts and allow natural regeneration. • Limit anthropogenic activities that cause surface disturbance, invasion, and fragmentation. (e.g., road and utility corridors, urban expansion, OHV use, and mineral/energy projects). • Detect and control new weed infestations.
Prevent – maintain or increase resilience and resistance of areas with declining ecological conditions that are at risk of conversion to a degraded, disturbed, or invaded state	
Priorities	• Ecosystems with moderate to high resilience and resistance – *ecological types with relatively cool and moist soil temperature and moisture regimes*. ○ Prioritize landscape patches that exhibit declining conditions due to annual grass invasion and/or tree expansion (e.g., at risk phase in State and Transition Models). • Ecosystems with a moderate to high probability of providing sage-grouse habitat, especially those with 26-65% landscape cover of sagebrush and adequate perennial native grasses and forbs – *all ecological types*.
Objectives	• Reduce fuel loads and decrease the risk of high intensity and high severity fire. • Increase abundance of perennial native grasses and forbs and of biological soil crusts where they naturally occur. • Decrease the longer-term risk of annual invasive grass dominance.
Activities	• Use mechanical treatments like cut and leave or mastication to remove trees, decrease woody fuels, and release native grasses and forbs in warm and moist big sagebrush ecosystems with relatively low resistance to annual invasive grasses that are in the early to mid-phase of piñon and/or juniper expansion. • Use prescribed fire or mechanical treatments to remove trees, decrease woody fuels, and release native grasses and forbs in cool and moist big sagebrush ecosystems with relatively high resistance to annual invasive grass that are in early to mid-phase of piñon and/or juniper expansion. • Actively manage post-treatment areas to increase perennial herbaceous species and minimize secondary weed invasion. • Consider the need for strategic fuel breaks to help constrain fire spread or otherwise augment suppression efforts.
Restore – increase resilience and resistance of disturbed, degraded, or invaded areas	
Priorities	• Areas burned by wildfire – *all ecological types* ○ Prioritize areas with low to moderate resilience and resistance, and that have a reasonable expectation of recovery. ○ Prioritize areas where perennial grasses and forbs have been depleted. ○ Prioritize areas that experienced high severity fire.

(continued)

Table 3. (Continued).

	• Sage-grouse habitat – *all ecological types*
	  ○ Prioritize areas where restoration of sagebrush and/or perennial grasses is needed to create large patches of landscape cover of sagebrush or connect existing patches of sagebrush habitat.
	  ○ Prioritize areas with adequate landscape cover of sagebrush where restoration of perennial grasses and forbs is needed.
	• Areas affected by anthropogenic activities that cause surface disturbance, invasion, and fragmentation. (e.g., road and utility corridors, urban expansion, OHV use, and mineral/energy projects) – *all ecological types.*

Objectives	• Increase soil stability and curtail dust. • Control/suppress invasive annual grasses and other invasive plants. • Increase landscape cover of sagebrush. • Increase perennial grasses and forbs and biological soil crusts where they naturally occur. • Reduce the risk of large fires that burn sage-grouse habitat.
Activities	• Use integrated strategies to control/suppress annual invasive grass and other annual invaders. • Establish and maintain fuel breaks or greenstrips in areas dominated by invasive annual grasses that are adjacent to areas with >25% landscape sagebrush cover and adequate perennial native grasses and forbs. • Seed perennial grasses and forbs that are adapted to local conditions to increase cover of these species in areas where they are depleted. • Seed and/or transplant sagebrush to restore large patches of sagebrush cover and connect existing patches. • Repeat restoration treatments if they fail initially to ensure restoration success especially in warm and dry soil temperature moisture regimes where weather is often problematic for establishment. • Actively manage restored/rehabilitated areas to increase perennial herbaceous species and minimize secondary weed invasion.
Monitoring and Adaptive Management– implement comprehensive monitoring to track landscape change and management outcomes and provide the basis for adaptive management	
Priorities	• Regional environmental gradients to track changes in plant community and other ecosystem attributes and expansion or contraction of species ranges – *all ecological types.* • Assess treatment effectiveness – *all ecological types.*
Objectives	• Understand effects of wildfire, annual grass invasion, piñon and juniper expansion, climate change and other global stressors in sagebrush ecosystems • Increase understanding of the long- and short-term outcomes of management treatments.
Activities	• Establish a regional network of monitoring sites that includes major environmental gradients. • Collect pre- and post-treatment monitoring data for all major land treatments activities. • Collect data on ecosystem status and trends (for example, land cover type, ground cover, vegetation cover and height [native and invasive], phase of tree expansion, soil and site stability, oddities). • Use consistent methods to monitor indicators. • Use a cross-boundary approach that involves all major land owners. • Use a common data base for all monitoring results (e.g., Land Treatment Digital Library; http://greatbasin.wr.usgs.gov/ltdl/). • Develop monitoring products that track change and provide management implications and adaptations for future management. • Support and improve information sharing on treatment effectiveness and monitoring results across jurisdictional boundaries (e.g., Great Basin Fire Science Delivery Project; www.gbfiresci.org).

Table 4. Specific management strategies by agency program area for the cells within the sage-grouse habitat matrix (table 2). The rows indicate relative resilience and resistance (numbers) and the columns indicate landscape cover of sagebrush by category (letters). Resilience and resistance are based on soil temperature and moisture regimes (fig. 11) and their relationship to ecological types (table 1). Percentage of the landscape dominated by sagebrush is based on the capacity of large landscapes to support viable sage-grouse populations over the long term (fig. 8). Note that these guidelines are related to the sage-grouse habitat matrix, and do not preclude other factors from consideration when determining management priorities for program areas. The "Fire Operations" program area includes preparedness, prevention, and suppression activities.

High Resilience to Disturbance and Resistance to Invasive Annual Grasses (1A, 1B, 1C)

Natural sagebrush recovery is likely to occur. Perennial herbaceous species are sufficient for recovery. Risk of invasive annual grasses is typically low.

Fire Operations	• Fire suppression is typically third order priority, but varies with large fire risk and landscape condition (cells 1A, 1B, 1C). Scenarios requiring higher priority may include: ○ Areas of sagebrush that bridge large, contiguous expanses of sagebrush and that are important for providing connectivity for sage-grouse (cells 1B, 1C). ○ Areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments (cells 1A, 1B, 1C) ○ Areas with later phase (Phase III) post-settlement piñon and juniper that have high resistance to control, are subject to large and/or severe fires, and place adjacent sage-grouse habitat at risk (cells 1A, 1B). ○ All areas when critical burning environment conditions exist. These conditions may be identified by a number of products including, but not limited to: Predictive Services 7-Day Significant Fire Potential Forecasts; National Weather Service Fire Weather Watches and Red Flag Warnings; fire behavior forecasts or other local knowledge.
Fuels Management	• Fuels management to reduce large sagebrush stand losses is a second order priority, especially in cells 1B and 1C. Management activities include: ○ Strategic placement of fuel breaks to reduce loss of large sagebrush stands by wildfire. Examples include linear features or other strategically placed treatments that serve to constrain fire spread or otherwise augment suppression efforts. ○ Tree removal in early to mid-phase (Phases I, II), post-settlement piñon and juniper expansion areas to maintain shrub/herbaceous cover and reduce fuel loads. ○ Tree removal in later phase (Phase III), post-settlement piñon and juniper areas to reduce risks of large or high severity fires. Because these areas represent non-sage-grouse habitat, prescribed fire may be appropriate on cool and moist sites, but invasive plant control and restoration of sagebrush and perennial native grasses and forbs may be necessary.
Post-Fire Rehabilitation	• Post-fire rehabilitation is generally low priority (cells 1A, 1B, 1C). Areas of higher priority include: ○ Areas where perennial herbaceous cover, density, and species composition is inadequate for recovery. ○ Areas where seeding or transplanting sagebrush is needed to maintain habitat connectivity for sage-grouse. ○ Steep slopes and soils with erosion potential.
Habitat Restoration and Recovery	• Restoration is typically passive and designed to increase or maintain perennial herbaceous species, biological soil crusts and landscape cover of sagebrush (cells 1A, 1B, 1C). Areas to consider for active restoration include: ○ Areas where perennial herbaceous cover density, or composition is inadequate for recovery after surface disturbance. ○ Areas where seeding or transplanting sagebrush is needed to maintain habitat connectivity for sage-grouse.

Moderate Resilience to Disturbance and Resistance to Invasive Annuals (2A, 2B, 2C)

Natural sagebrush recovery is likely to occur on cooler and moister sites, but the time required may be too great if large, contiguous areas lack sagebrush. Perennial herbaceous species are usually adequate for recovery on cooler and moister sites. Risk of invasive annual grasses is moderately high on warmer and drier sites.

Fire Operations	• Fire suppression is typically second order priority (cells 2A, 2B, 2C). Scenarios requiring higher priority may include: ○ Areas of sagebrush that bridge large, contiguous expanses of sagebrush and that are important for providing connectivity for sage-grouse (cells 2B, 2C).

(continued)

Table 4. (Continued).

	○ Areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments (cells 2A, 2B, 2C) ○ Areas with later phase (Phase III), post-settlement piñon and juniper that have high resistance to control, are subject to large and/or severe fires, and place adjacent sage-grouse habitat at risk (cells 2A, 2B). ○ Areas where annual grasslands place adjacent sage-grouse habitat at risk (cell 2A). ○ All areas when critical burning environment conditions exist. These conditions may be identified by a number of products including, but not limited to: Predictive Services 7-Day Significant Fire Potential Forecasts; National Weather Service Fire Weather Watches and Red Flag Warnings; fire behavior forecasts or other local knowledge.
Fuels Management	• Fuels management to reduce large sagebrush stand losses is a first order priority, especially in cells 2B and 2C. Management activities include: ○ Strategic placement of fuel breaks to reduce loss of large sagebrush stands by wildfire. Examples include linear features or other strategically placed treatments that serve to constrain fire spread or otherwise augment suppression efforts. ○ Tree removal in early to mid-phase (Phase I, II), post-settlement piñon and juniper expansion areas to maintain shrub/herbaceous cover and reduce fuel loads. ○ Tree removal in later phase (Phase III), post-settlement piñon and juniper areas to reduce risks of large or high severity fires. Because these areas represent non-sage-grouse habitat, prescribed fire may be appropriate on cool and moist sites, but restoration of sagebrush and perennial native grasses and forbs may be necessary.
Post-Fire Rehabilitation	• Post-fire rehabilitation is generally low priority (cells 2A, 2B, 2C) in cooler and moister areas. Areas of higher priority include: ○ Areas where perennial herbaceous cover, density, and species composition is inadequate for recovery. ○ Areas where seeding or transplanting sagebrush is needed to maintain habitat connectivity for sage-grouse. ○ Relatively warm and dry areas where annual invasives are expanding. ○ Steep slopes with erosion potential.
Habitat Restoration and Recovery	• Restoration is typically passive on cooler and moister areas and is designed to increase or maintain perennial herbaceous species, biological soil crusts, and landscape cover of sagebrush (cells 2A, 2B, 2C). Areas to consider for active restoration include: ○ Areas where perennial herbaceous cover, density, and species composition is inadequate for recovery after surface disturbance. ○ Areas where seeding or transplanting sagebrush is needed to maintain habitat connectivity for sage-grouse. ○ Relatively warm and dry areas where annual invasives are expanding.
Low Resilience to Disturbance and Resistance to Invasive Annuals (3A, 3B, 3C)	
Natural sagebrush recovery is not likely. Perennial herbaceous species are typically inadequate for recovery. Risk of invasive annual grasses is high.	
Fire Operations	• Fire suppression priority depends on the landscape cover of sagebrush: ○ Areas with <25% landscape cover of sagebrush are typically third order priority (cell 3A). These areas may be a higher priority if they are adjacent to intact sage-grouse habitat or are essential for connectivity. ○ Areas with 26-65% landscape cover of sagebrush are typically second order priority (cell 3B). These areas are higher priority if they have intact understories and if they are adjacent to sage-grouse habitat. ○ Areas with >65% landscape cover of sagebrush are first order priority (cell 3C). ○ Areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments (cells 3A, 3B, 3C).

(continued)

Table 4. (Continued).

Fuels Management	• Fuels management priority and management activities depend on the landscape cover of sagebrush: ○ Areas with <25% landscape cover of sagebrush are typically third order priority (cell 3A). Strategic placement of fuel breaks may be needed to reduce loss of adjacent sage-grouse habitat by wildfire. Examples include linear features or other strategically placed treatments that serve to constrain fire spread or otherwise augment suppression efforts. ○ Areas with 26-65% landscape cover of sagebrush are typically second order priority (cell 3B). These areas are higher priority if they have intact understories and if they are adjacent to sage-grouse habitat. Strategic placement of fuel breaks may be needed to reduce loss of large sagebrush stands by wildfire. ○ Areas with >65% landscape cover of sagebrush are first order priority (cell 3C). Strategic placement of fuel breaks may be needed to reduce loss of large sagebrush stands by wildfire. ○ Areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments (cells 3A, 3B, 3C). Strategic placement of fuel breaks may be needed to protect investments from repeated loss to wildfire.
Post-Fire Rehabilitation	• Post-fire rehabilitation priority and management activities depend on the landscape cover of sagebrush: ○ Areas with <25% landscape cover of sagebrush are typically third order priority (cell 3A). Exceptions include (1) sites that are relatively cool and moist and (2) areas adjacent to sage-grouse habitat where seeding can be used to increase connectivity and prevent annual invasive spread. In highly invaded areas, integrated strategies that include seeding of perennial herbaceous species and seeding and/or transplanting sagebrush will be required. Success will likely require more than one intervention due to low and variable precipitation. ○ Areas with 26-65% landscape cover of sagebrush are typically second order priority (cell 3B). Exceptions include (1) sites that are relatively cool and moist or that are not highly invaded, and (2) areas adjacent to sage-grouse habitat where seeding can be used to increase connectivity and prevent annual invasive spread. Seeding of perennial herbaceous species will be required where cover, density and species composition of these species is inadequate for recovery. Seeding and/or transplanting sagebrush as soon as possible is necessary for rehabilitating sage-grouse habitat. Success will likely require more than one intervention due to low and variable precipitation. ○ Areas with >65% landscape cover of sagebrush are first order priority, especially if they are part of a larger, contiguous area of sagebrush (cell 3C). Seeding of perennial herbaceous species will be required where cover, density and species composition of these species is inadequate for recovery. Seeding and/or transplanting sagebrush as soon as possible is necessary for rehabilitating sage-grouse habitat. Success will likely require more than one intervention due to low and variable precipitation.
Habitat Restoration and Recovery	• Restoration priority and management activities depends on the landscape cover of sagebrush: ○ Areas with <25% landscape cover of sagebrush are typically third order priority. Exceptions include (1) surface disturbances and (2) areas adjacent to sage-grouse habitat where seeding can be used to prevent annual invasive spread (cell 3A). In highly invaded areas, integrated strategies that include seeding of perennial herbaceous species and seeding and/or transplanting sagebrush will be required. Success will likely require more than one intervention due to low and variable precipitation. ○ Areas with 26-65% landscape cover of sagebrush are typically second order priority (cell 3B). Exceptions include (1) surface disturbances, (2) sites that are relatively cool and moist or that are not highly invaded, and (3) areas adjacent to sage-grouse habitat where seeding can be used to increase connectivity and prevent annual invasive spread. Seeding of perennial herbaceous species may be required where cover, density and species composition of these species is inadequate. Seeding and/or transplanting sagebrush as soon as possible is necessary for restoring sage-grouse habitat. Success will likely require more than one intervention due to low and variable precipitation. ○ Areas with >65% landscape cover of sagebrush are first order priority, especially if they are part of a larger, contiguous area of sagebrush (cell 3C). Seeding of perennial herbaceous species may be required where cover, density, and species composition of these species is inadequate. Seeding and/or transplanting sagebrush as soon as possible is necessary for restoring sage-grouse habitat. Success will likely require more than one intervention due to low and variable precipitation.

Another important consideration is that ecological processes such as wildfire can occur either within or across categories in the sage-grouse habitat matrix and it is necessary to determine the appropriate spatial context when evaluating management opportunities based on resilience and resistance and sage-grouse habitat. For example, if critical sage-grouse habitat occurs in close proximity to landscapes comprised mainly of annual grass-dominated plant communities, then fire risk to adjacent sage-grouse habitat can increase dramatically (Balch et al. 2013). In this scenario, management actions could include reducing the influence of invasive annual grasses with a strategic fuel break on the perimeter of intact sagebrush. Thus, management actions may have value to sustaining existing sage-grouse habitat, even if these measures are applied in locations that are currently not habitat; the spatial relationships of sagebrush and invasive annual grasses should be considered when prioritizing management actions and associated conservation measures.

Informing Wildfire and Fuels Management Strategies to Conserve Sage-Grouse

Collectively, responses to wildfires and implementation of fuels management projects are important contributors to sage-grouse conservation. Resilience and resistance concepts provide a science-based background that can inform fire operations and fuels management strategies and allocation of scarce assets during periods of high fire activity. In fire operations, firefighter and public safety is the overriding objective in all decisions. In addition, land managers consider numerous other values at risk, including the Wildland-Urban Interface (WUI), habitats, and infrastructure when allocating assets and prioritizing efforts. Resilience and resistance concepts are especially relevant for evaluating tradeoffs related to current ecological conditions and rates of recovery and possible ecological consequences of different fire management activities. For example, prioritizing initial attack efforts based on ecological types and their resilience and resistance at fire locations is a possible future application of resilience and resistance concepts. Also, fire prevention efforts can be concentrated where human ignitions have commonly occurred near intact, high quality habitats that also have inherently low resilience and resistance.

Fuels management projects are often applied to (1) constrain or minimize fire spread; (2) alter species composition; (3) modify fire intensity, severity, or effects; or (4) create fuel breaks or anchor points that augment fire management efforts (fig. 13). These activities are selectively used based on the projected ecosystem response, anticipated fire patterns, and probability of success. For example, in areas that are difficult to restore due to low to moderate resilience, fuel treatments can be placed to minimize fire spread and conserve sagebrush habitat. In cooler and moister areas with moderate to high resilience and resistance, mechanical or prescribed fire treatments may be appropriate to prevent conifer expansion and dominance. Given projected climate change and longer fire seasons across the western United States, fuels management represents a proactive approach for modifying large fire trends. Fire operations and fuels management programs contribute to a strategic, landscape approach when coupled with data that illustrate the likelihood of fire occurrence, potential fire behavior, and risk assessments (Finney et al. 2010; Oregon Department of Forestry 2013). In tandem with resilience and resistance concepts, these data can further inform fire operations and fuels management decisions.

Figure 13. Fuel breaks may include roads, natural features, or other management imposed treatments intended to modify fire behavior or otherwise augment suppression efforts at the time of a fire. Such changes in fuel type and arrangement may improve suppression effectiveness by modifying flame length and fire intensity, and allow fire operations to be conducted more safely. The top photo shows a burnout operation along an existing road to remove available fuels ahead of an oncoming fire and constrain overall fire growth (photo by BLM Idaho Falls District). The bottom photo shows fuel breaks located along a road, which complimented fire control efforts when a fire intersected the fuel break and road from the right (photo by Ben Dyer, BLM).

Putting it all Together

Effective management and restoration of sage-grouse habitat will benefit from a collaborative approach that prioritizes the best management practices in the most appropriate places. This section describes an approach for assessing focal areas for sage-grouse habitat management based on widely available data, including (1) Priority Areas for Conservation (PACs), (2) breeding bird densities, (3) habitat suitability as indicated by the landscape cover of sagebrush, (4) resilience and resistance and dominant ecological types as indicated by soil temperature and moisture regimes, and (5) habitat threats as indicated by cover of cheatgrass, cover of piñon and juniper, and by fire history. Breeding bird density data are overlain with landscape cover of sagebrush and with resilience and resistance to spatially link sage-grouse populations with habitat conditions and risks. We illustrate the use of this step-down approach for evaluating focal areas for sage-grouse habitat management across the western portion of the range, and we provide a detailed example for a diverse area in the northeast corner of Nevada that is comprised largely of PACs with mixed land ownership. The sage-grouse habitat matrix (table 2) is used as a tool in the decision process, and guidelines are provided to assist in determining appropriate management strategies for the primary agency program areas (fire operations, fuels management, post-fire rehabilitation, habitat restoration) for each cell of the matrix.

We conclude with discussions of the tools available to aid in determining the suitability of an area for treatment and the most appropriate management treatments such as ecological site descriptions and state and transition models and of monitoring and adaptive management. Datasets used to compile the maps in the following sections are in Appendix 4.

Assessing Focal Areas for Sage-Grouse Habitat Management: Key Data Layers

Priority areas for conservation: The recent identification of sage-grouse strongholds, or Priority Areas for Conservation (PACs), greatly improves the ability to target management actions towards habitats expected to be critical for long-term viability of the species (fig. 14; USFWS 2013). Understanding and minimizing risks of large-scale loss of sagebrush and conversion to invasive annual grasses or piñon and juniper in and around PACs will be integral to maintaining sage-grouse distribution and stabilizing population trends. PACs were developed by individual states to identify those areas that are critical for ensuring adequate representation, redundance, and resilience to conserve sage-grouse populations. Methods differed among states; in general, PAC boundaries were identified based on (1) sage-grouse population data including breeding bird density, lek counts, telemetry, nesting areas, known distributions, and sightings/observations; and (2) habitat data including occupied habitat, suitable habitat, seasonal habitat, nesting and brood rearing areas, and connectivity areas or corridors. Sage-grouse habitats outside of PACs also are important in assessing focal areas for management where they provide connectivity between PACs (genetic and habitat linkages), seasonal habitats that may have been underestimated due to emphasis on lek sites to define priority areas, habitat restoration and population expansion opportunities, and flexibility for managing habitat changes that may result from climate change (USFWS 2013). If PAC boundaries are adjusted, they will need to be updated for future analyses.

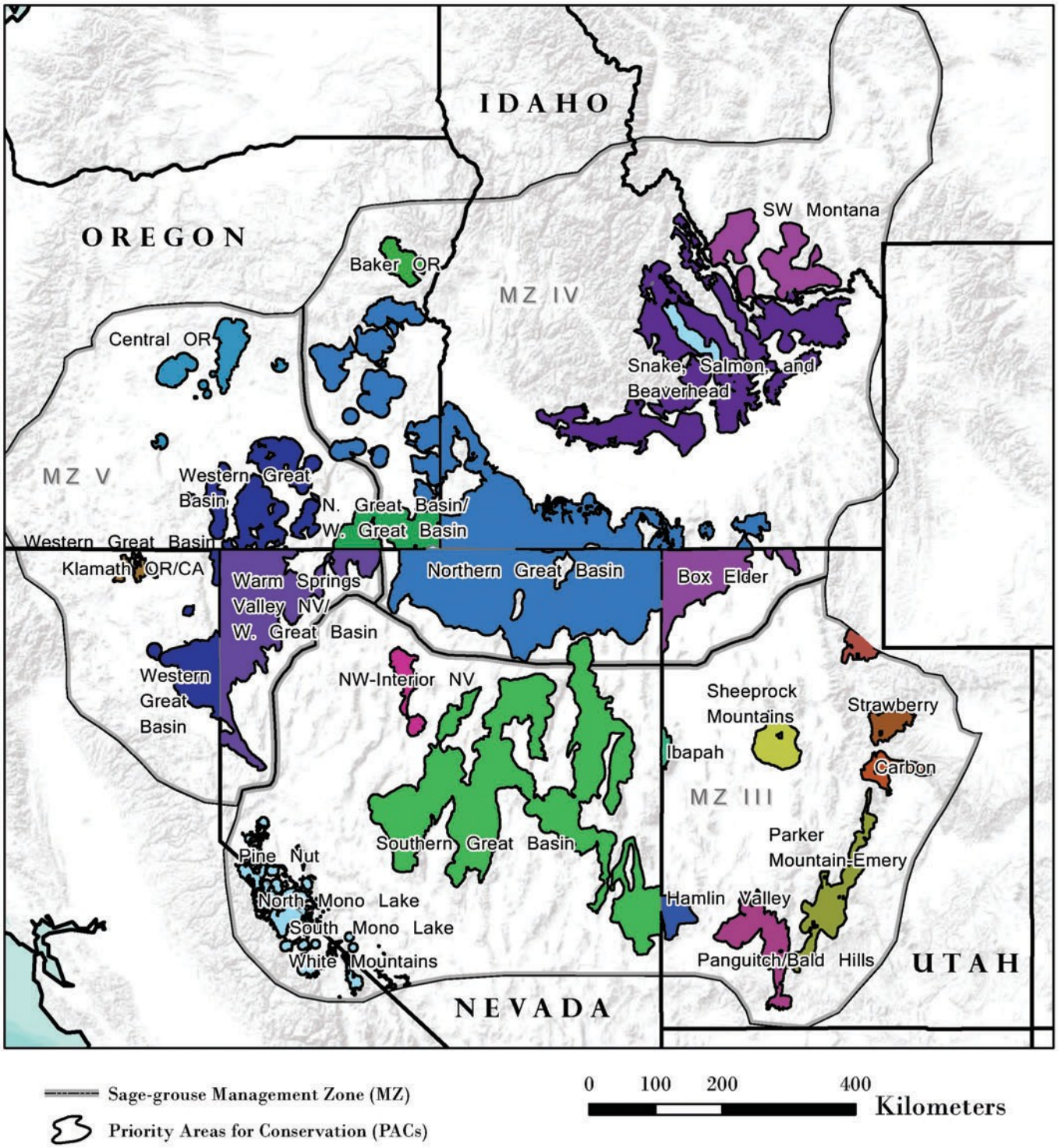

Figure 14. Priority Areas for Conservation (PACs) within the range of sage-grouse (USFWS 2013). Colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

Breeding bird density: Range-wide breeding bird density areas provide one of the few accessible data sets for further prioritizing actions within and adjacent to PACs to maintain species distribution and abundance. Doherty et al. (2010b) developed a useful framework for incorporating population data in their range-wide breeding bird density analysis, which used maximum counts of males on leks (n = 4,885) to delineate breeding bird density areas that contain 25, 50, 75, and 100% of the known breeding population (fig. 15). Leks were mapped according to these abundance values and buffered by a 6.4 to 8.5 km (4.0 to 5.3 mi) radius to delineate nesting areas. Findings showed that while sage-grouse occupy extremely large landscapes, their breeding distribution is highly aggregated in comparably smaller identifiable population centers; 25% of the known population occurs within 3.9% (2.9 million ha; 7.2 million ac) of the species range, and 75% of birds are within 27.0% of the species range (20.4 million ha; 50.4 million ac) (Doherty et al. 2010b). The Doherty et al. (2010b) analysis emphasized breeding habitats primarily because little broad scale data exist for summer and winter habitat use areas. Even though the current breeding bird density data provide the most comprehensive data available, they do not include all existing sage-grouse populations. Incorporating finer scale seasonal habitat use data at local levels where it is available will ensure management actions encompass all seasonal habitat requirements.

For this assessment, we chose to use State-level breeding bird density results from Doherty et al. (2010b) instead of range-wide model results to ensure that important breeding areas in MZs III, IV, and V were not underweighted due to relatively higher bird densities in the eastern portion of the range. It is important to note that breeding density areas were identified using best available information in 2009, so these range-wide data do not reflect the most current lek count information or changes in conditions since the original analysis. Also, breeding density areas should not be viewed as rigid boundaries but rather as the means to prioritize landscapes regionally where step-down assessments and actions may be implemented quickly to conserve the most birds.

Landscape cover of sagebrush: Landscape cover of sagebrush is one of the key determinants of sage-grouse population persistence and, in combination with an understanding of resilience todisturbance andresistance to invasive annuals, providesessential information both for determining priority areas for management and appropriate management actions (fig. 10; tables 2 and 3). Landscape cover of sagebrush is a measure of large, contiguous patches of sagebrush on the landscape and is calculated from remote sensing databases such as LANDFIRE (see Appendix 4). We used the three cover categories of sagebrush landscape cover discussed previously to predict the likelihood of sustaining sage-grouse populations (1-25%, 25-65%, >65%). The sagebrush landscape cover datasets were created using a moving window to summarize the proportion of area (5-km [3.1-mi] radius) dominated by sagebrush surrounding each 30-m pixel and then assigned those areas to the three categories (see Appendix 2). Because available sagebrush cover from sources such as LANDFIRE does not exclude recent fire perimeters, it was necessary to either include these in the analysis of landscape cover of sagebrush or display them separately. Although areas that have burned since 2000 likely do not currently provide desired sage-grouse habitat, areas with the potential to support sagebrush ecological types can provide conservation benefits in the overall planning effort especially within long-term conservation areas like PACs. The landscape cover of sagebrush and recent fire perimeters are illustrated for the western portion of the range (fig.16) and northeast Nevada (fig. 17).

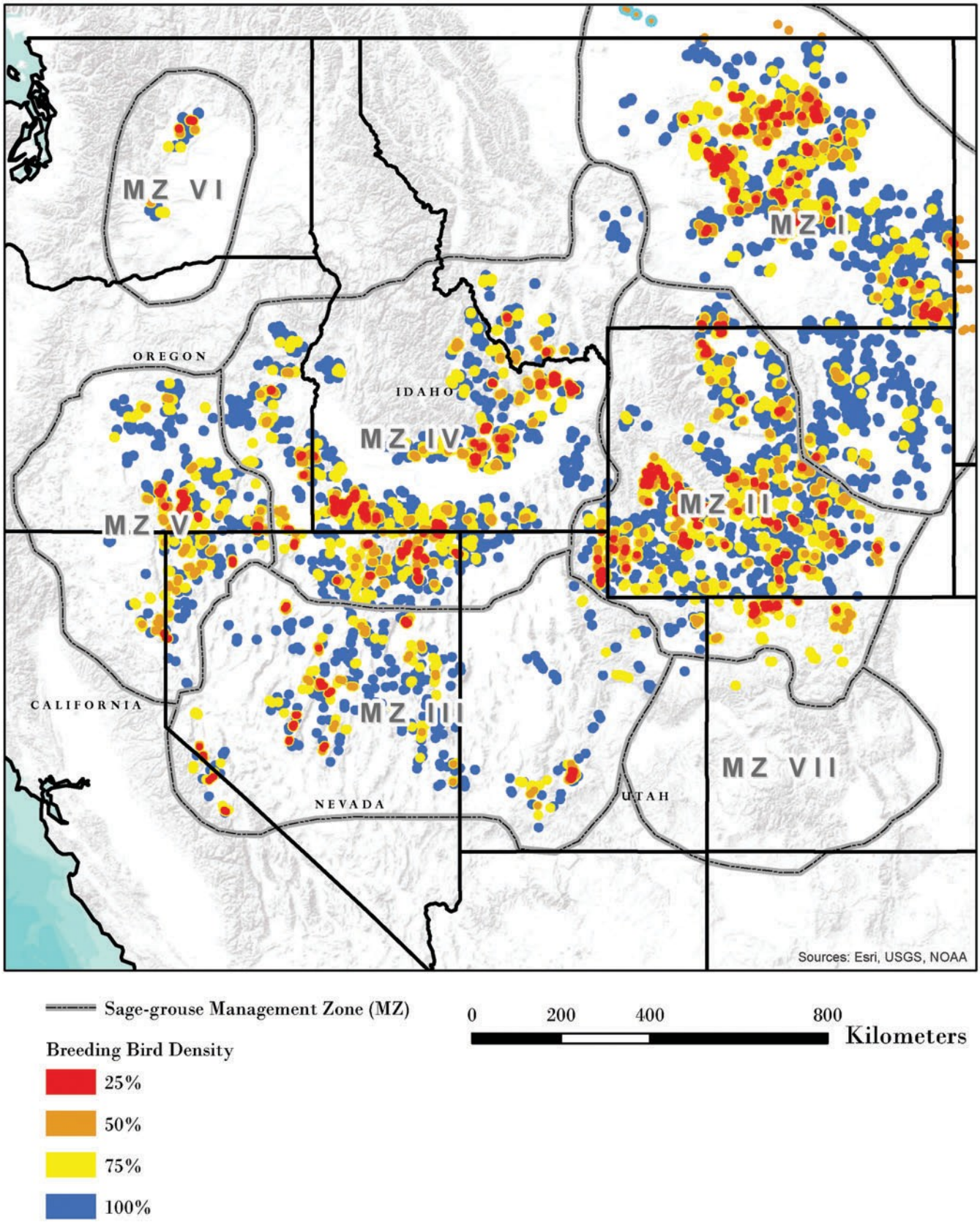

Figure 15. Range-wide sage-grouse breeding bird densities from Doherty et al. 2010. Points illustrate breeding bird density areas that contain 25, 50, 75, and 100% of the known breeding population and are based on maximum counts of males on leks (n = 4,885). Leks were mapped according to abundance values and buffered by 6.4 to 8.5 km (4.0 to 5.2 mi) to delineate nesting areas.

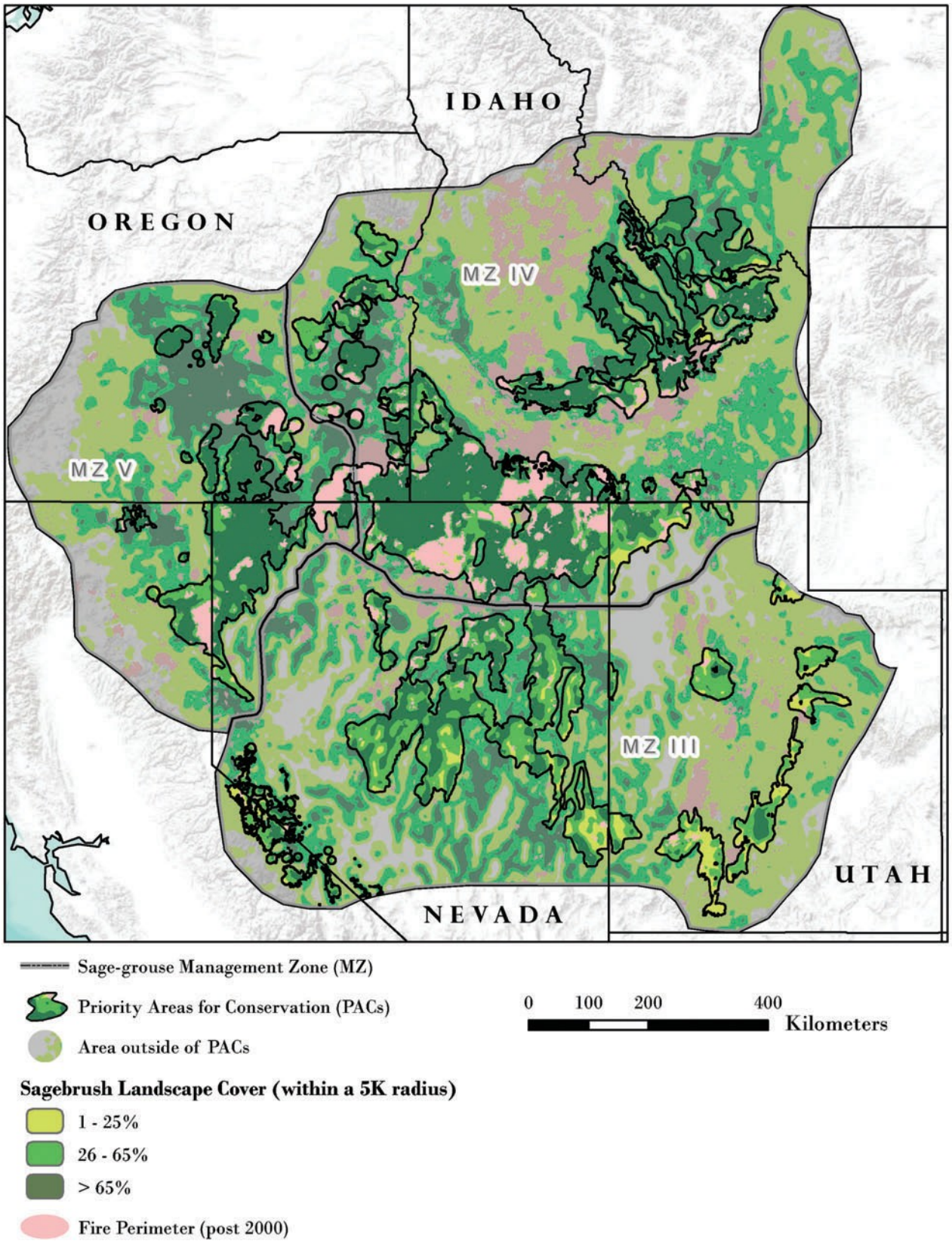

Figure 16. The landscape cover of sagebrush within each of three selected categories (1-25%, 26-65%, >65%) for Management Zones III, IV, and V (Stiver et al. 2006). The proportion of sagebrush (USGS 2013) within each of the categories in a 5-km (3.1-mi) radius surrounding each pixel was calculated relative to other land cover types for locations with sagebrush cover. Darker colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

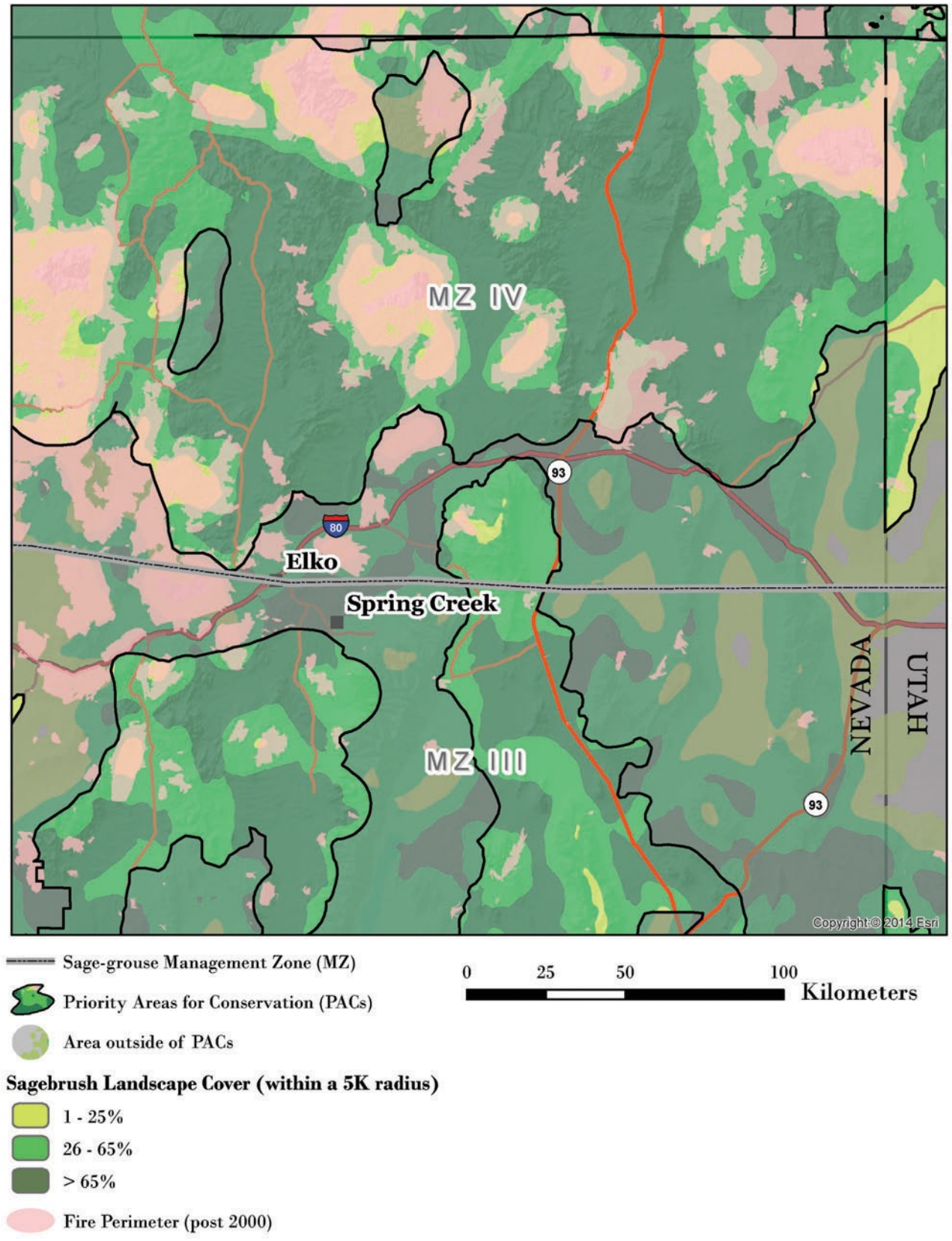

Figure 17. The landscape cover of sagebrush within each of the selected categories (1-25%, 26-65%, >65%) for the north-eastern portion of Nevada. The proportion of sagebrush (USGS 2013) within each of the categories in a 5-km (3.1-mi) radius surrounding each pixel was calculated relative to other land cover types for locations with sagebrush cover. Darker colored polygons delineate Priority Areas for Conservation (USFWS 2013).

Resilience to disturbance and resistance to annuals: Soil temperature and moisture regimes are a strong indicator of ecological types and of resilience to disturbance and resistance to invasive annual plants (fig. 11; table 1). Resilience and resistance predictions coupled with landscape cover of sagebrush can provide critical information for determining focal areas for targeted management actions (tables 2, 3, and 4). The available data for the soil temperature and moisture regimes were recently compiled to predict resilience and resistance (see Appendix 3). These data, displayed for the western portion of the range and northeast Nevada (figs. 18 and 19), illustrate the spatial variability within the focal areas. Soil temperature and moisture regimes are two of the primary determinants of ecological types and of more detailed ecological site descriptions, which are described in the section on "Determining the Most Appropriate Management Treatments at the Project Scale."

Habitat threats: Examining additional land cover data or models of invasive annual grasses and piñon and/or juniper, can provide insights into the current extent of threats in a planning area (e.g., Manier et al. 2013). In addition, evaluating data on fire occurrence and size can provide information on fire history and the rate and pattern of change within the planning area. Data layers for cheatgrass cover have been derived from Landsat imagery (Peterson 2006, 2007) and from model predictions based on species occurrence, climate variables, and anthropogenic disturbance (e.g., the Bureau of Land Management [BLM] Rapid Ecoregional Assessments [REAs]). The REAs contain a large amount of geospatial data that may be useful in providing landscape scale information on invasive species, disturbances, and vegetation types across most of the range of sage-grouse (http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html). Similarly, geospatial data for piñon and/or juniper have been developed for various States (e.g., Nevada and Oregon) and are becoming increasingly available rangewide. In addition, more refined data products are often available at local scales. Land managers can evaluate the available land cover datasets and select those land covers with the highest resolution and accuracy for the focal area. Land cover of cheatgrass and piñon and/or juniper and the fire history of the western portion of the range and northeast Nevada are in figures 20-25.

Assessing Focal Areas for Sage-Grouse Habitat Management: Integrating Data Layers

Combining resilience and resistance concepts with sage-grouse habitat and population data can help land managers further gauge relative risks across large landscapes and determine where to focus limited resources to conserve sage-grouse populations. Intersecting breeding bird density areas with soil temperature and moisture regimes provides a spatial tool to depict landscapes with high bird concentrations that may have a higher relative risk of being negatively affected by fire and annual grasses (figs. 26, 27). For prioritization purposes, areas supporting 75% of birds (6.4 to 8.5 km [4.0 to 5.2 mi] buffer around leks) can be categorized as high density while remaining breeding bird density areas (75-100% category; 8.5-km [5.2-mi] buffer around leks) can be categorized as low density. Similarly, warm and dry types can be categorized as having relatively low resilience to fire and resistance to invasive species and all other soil temperature and moisture regimes can be categorized as having relatively moderate to high resilience and resistance. Intersecting breeding bird density areas with landscape cover of sagebrush provides another spatial component revealing large and intact habitat blocks and areas in need of potential restoration to provide continued connectivity (fig. 28).

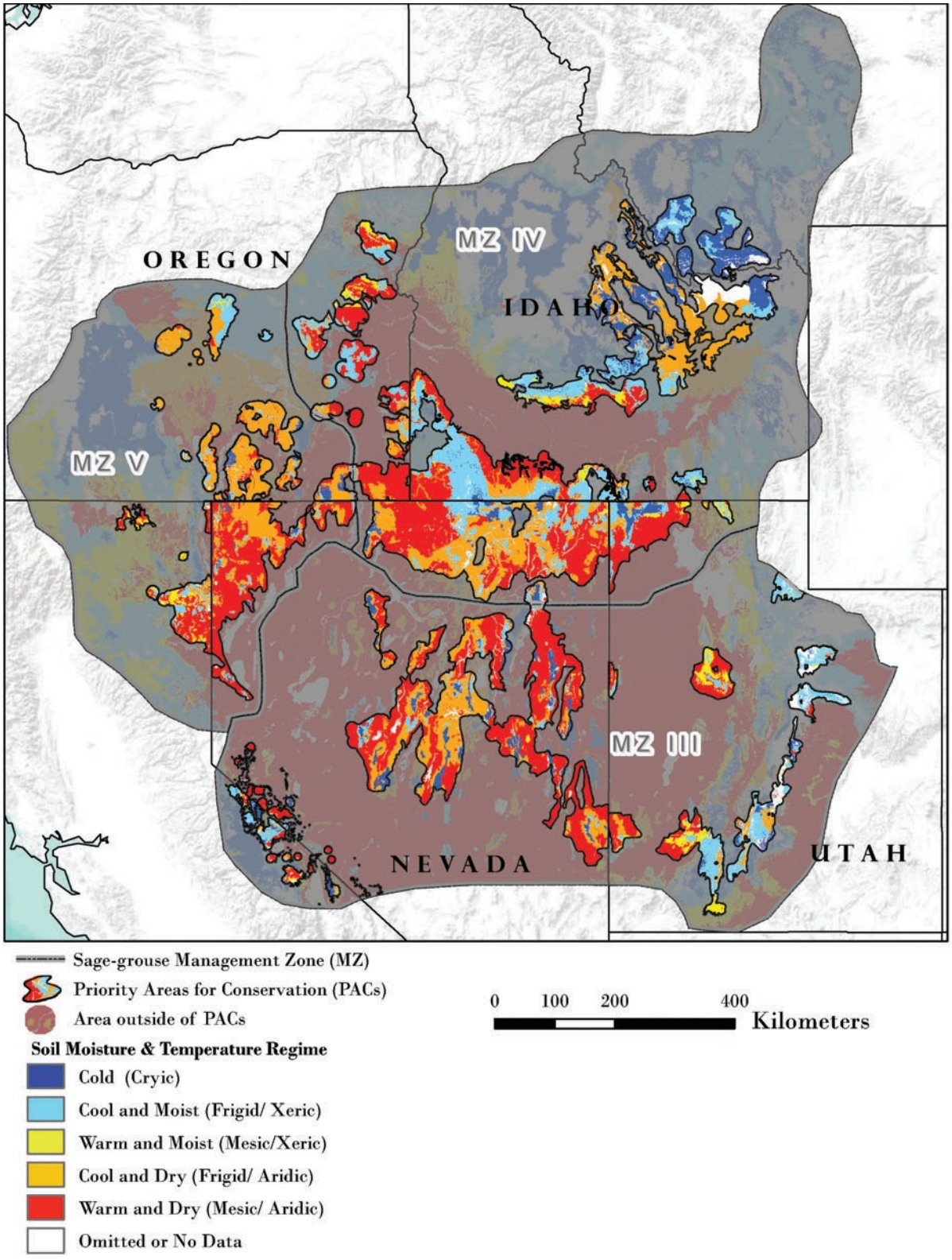

Figure 18. The soil temperature and moisture regimes within sage-grouse Management Zones III, IV, and V (Stiver et al. 2006). Soil temperature and moisture classes were derived from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) (Soil Survey Staff 2014a). Gaps in that dataset were filled in with the NRCS State Soil Geographic Database (STATSGO) (Soil Survey Staff 2014b). Darker colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

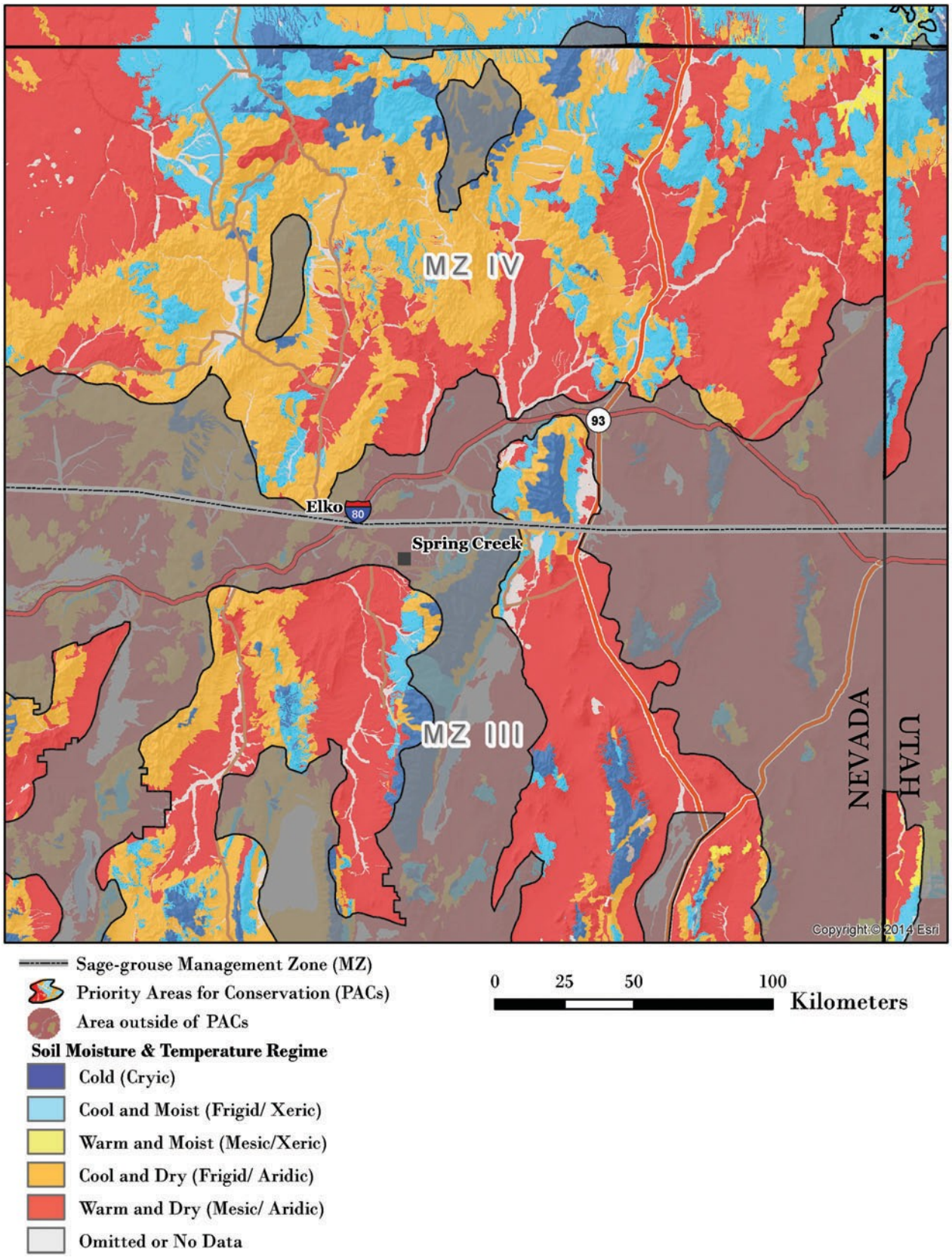

Figure 19. The soil temperature and moisture regimes for the northeast corner of Nevada. Soil temperature and moisture classes were derived from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) (Soil Survey Staff 2014a). Gaps in that dataset were filled in with the NRCS State Soil Geographic Database (STATSGO) (Soil Survey Staff 2014b). Darker colored polygons delineate Priority Areas for Conservation (USFWS 2013).

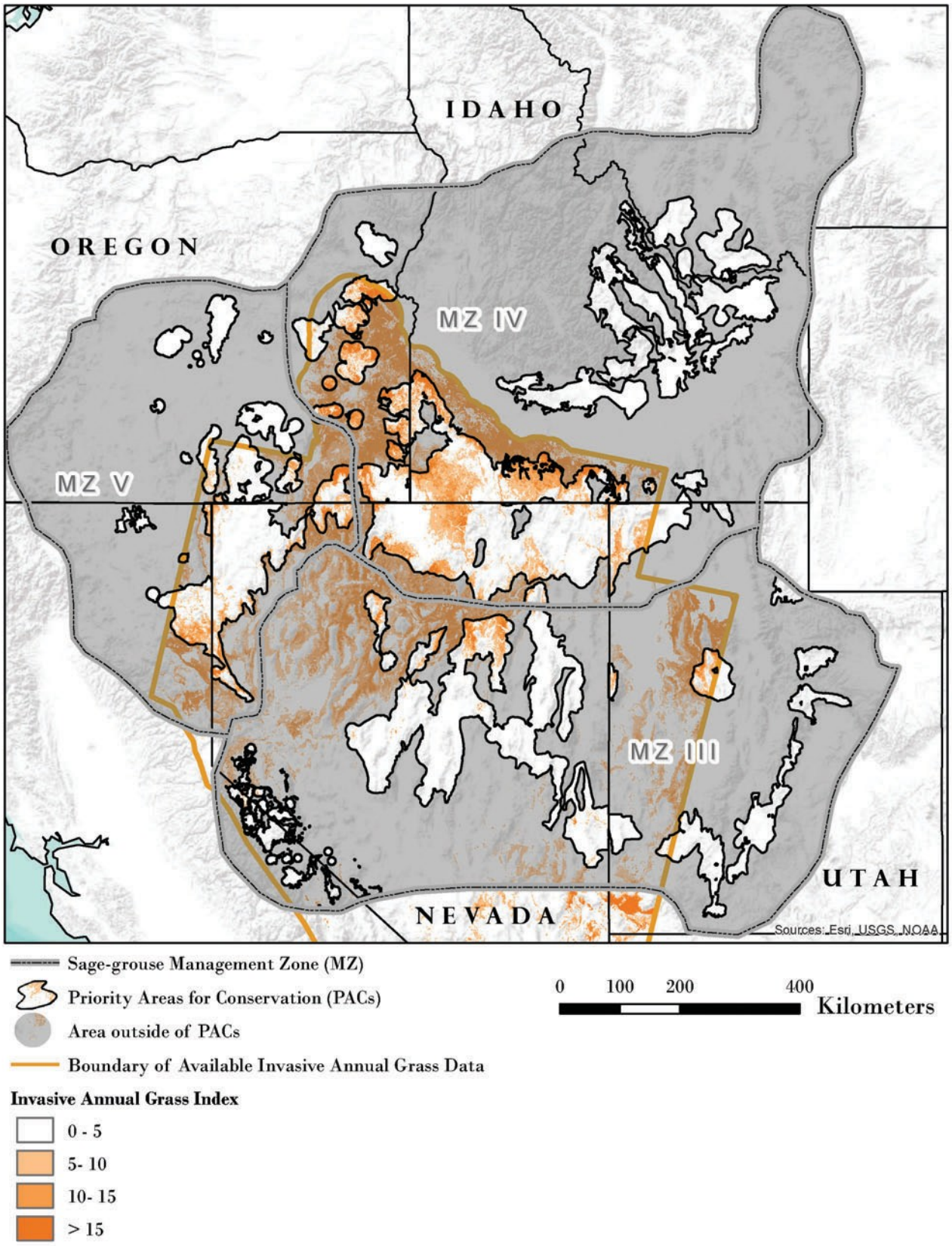

Figure 20. Invasive annual grass index for Nevada (Peterson 2006) and the Owhyee uplands (Peterson 2007) displayed for sage-grouse Management Zones III, IV, and V (Stiver et al. 2006). Lighter colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

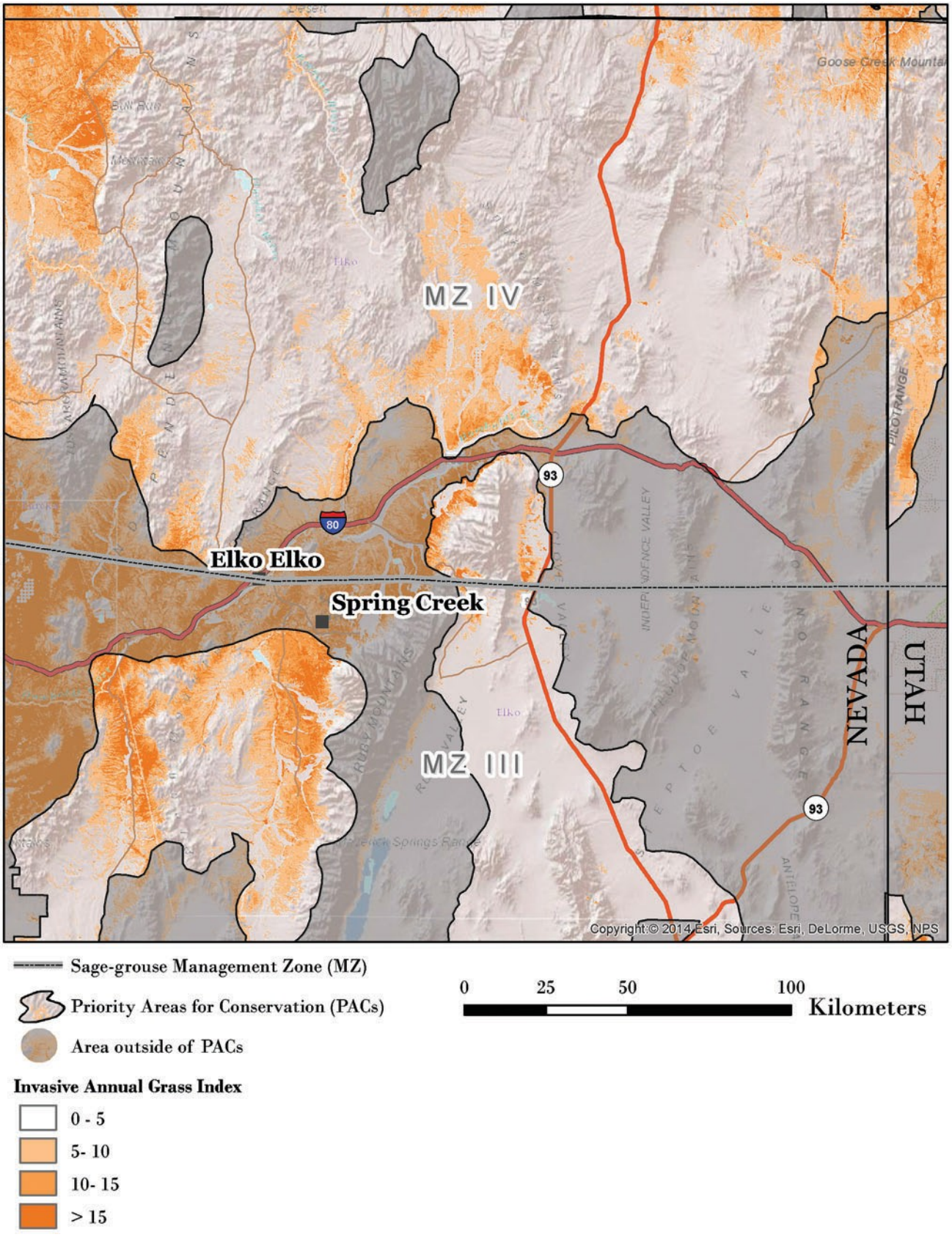

Figure 21. Invasive annual grass index for Nevada (Peterson 2006) and the Owhyee uplands (Peterson 2007) displayed for the northeast corner of Nevada. Lighter colored polygons delineate Priority Areas for Conservation (USFWS 2013).

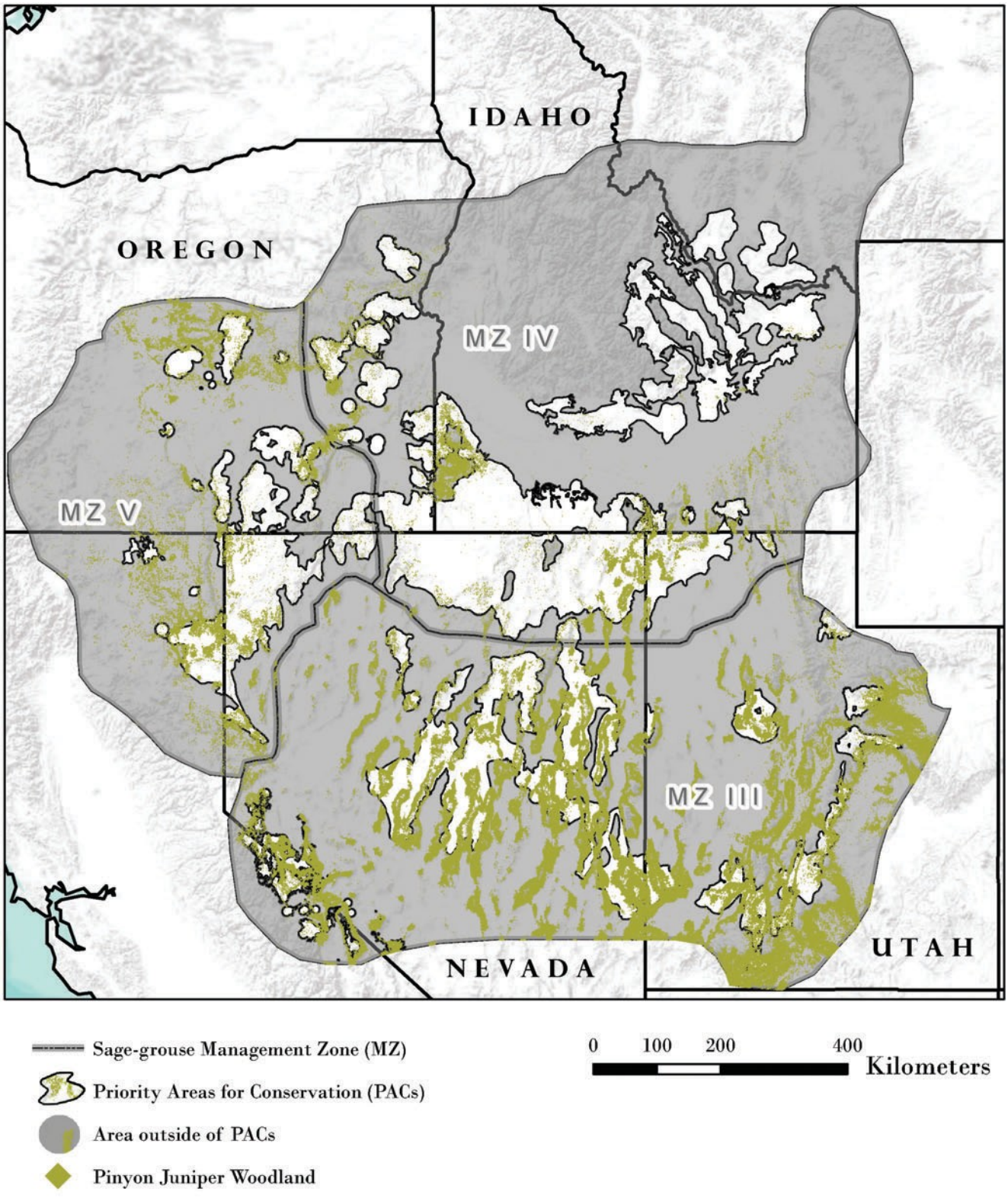

Figure 22. Piñon and/or juniper woodlands (USGS 2004; USGS 2013) within sage-grouse Management Zones III, IV, and V (Stiver et al. 2006). Lighter colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

Figure 23. Piñon and/or juniper woodlands (USGS 2004; USGS 2013) within the northeast corner of Nevada. Lighter colored polygons delineate Priority Areas for Conservation (USFWS 2013).

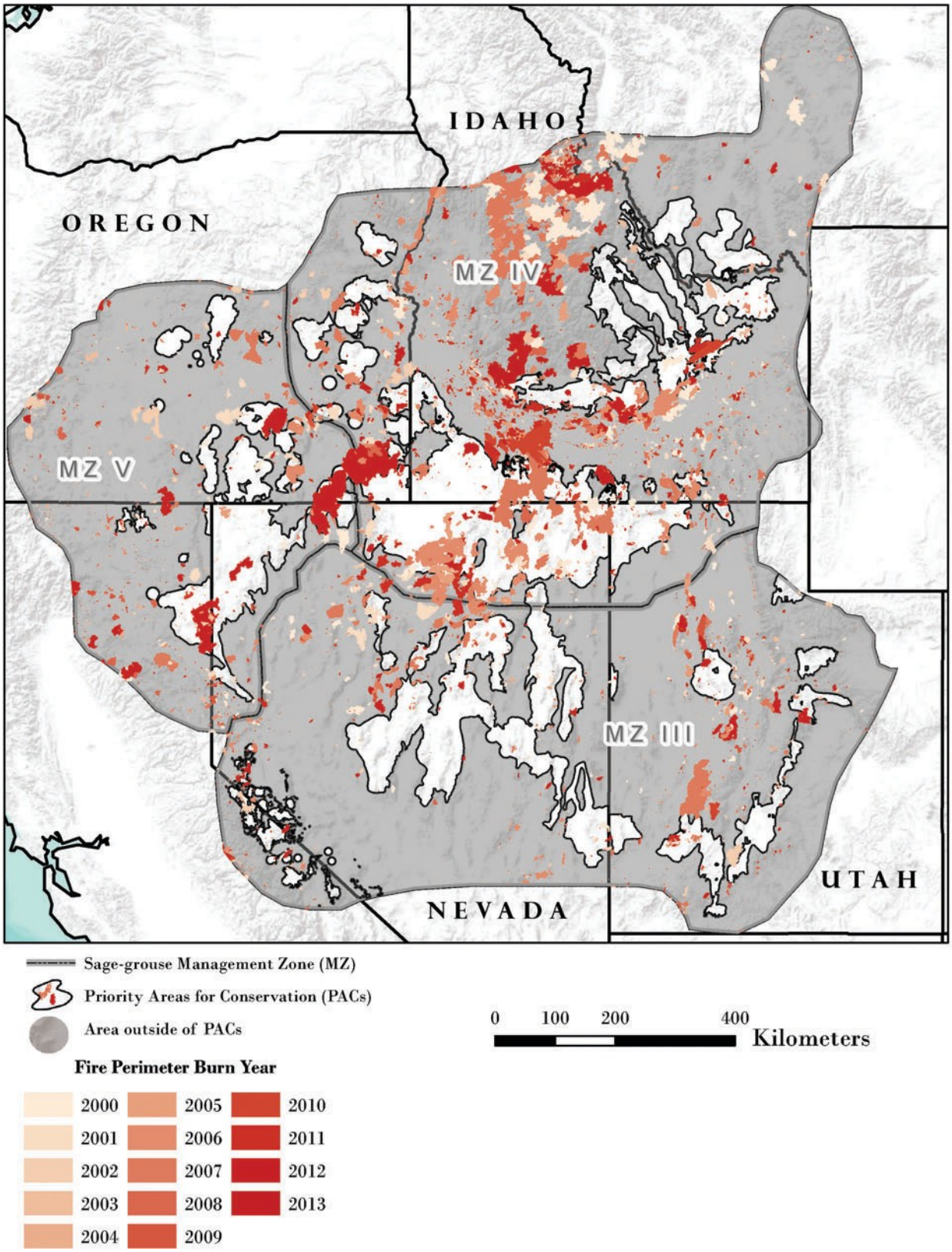

Figure 24. Fire perimeters (Walters et al. 2011; Butler and Bailey 2013) within sage-grouse Management Zones III, IV, and V (Stiver et al. 2006). Ligher colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

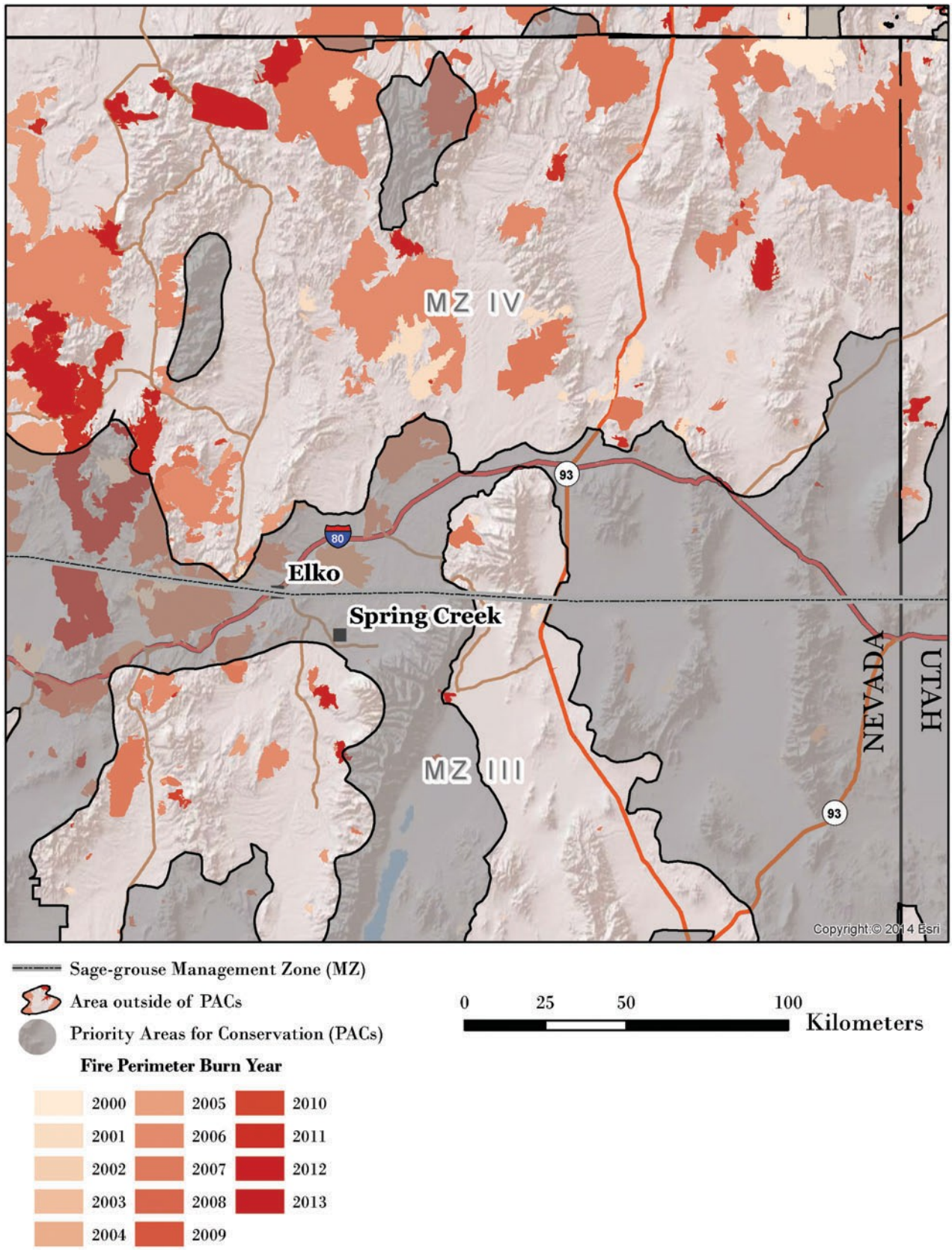

Figure 25. Fire perimeters (Walters et al. 2011; Butler and Bailey 2013) within the northeast corner of Nevada. Lighter colored polygons delineate Priority Areas for Conservation (USFWS 2013).

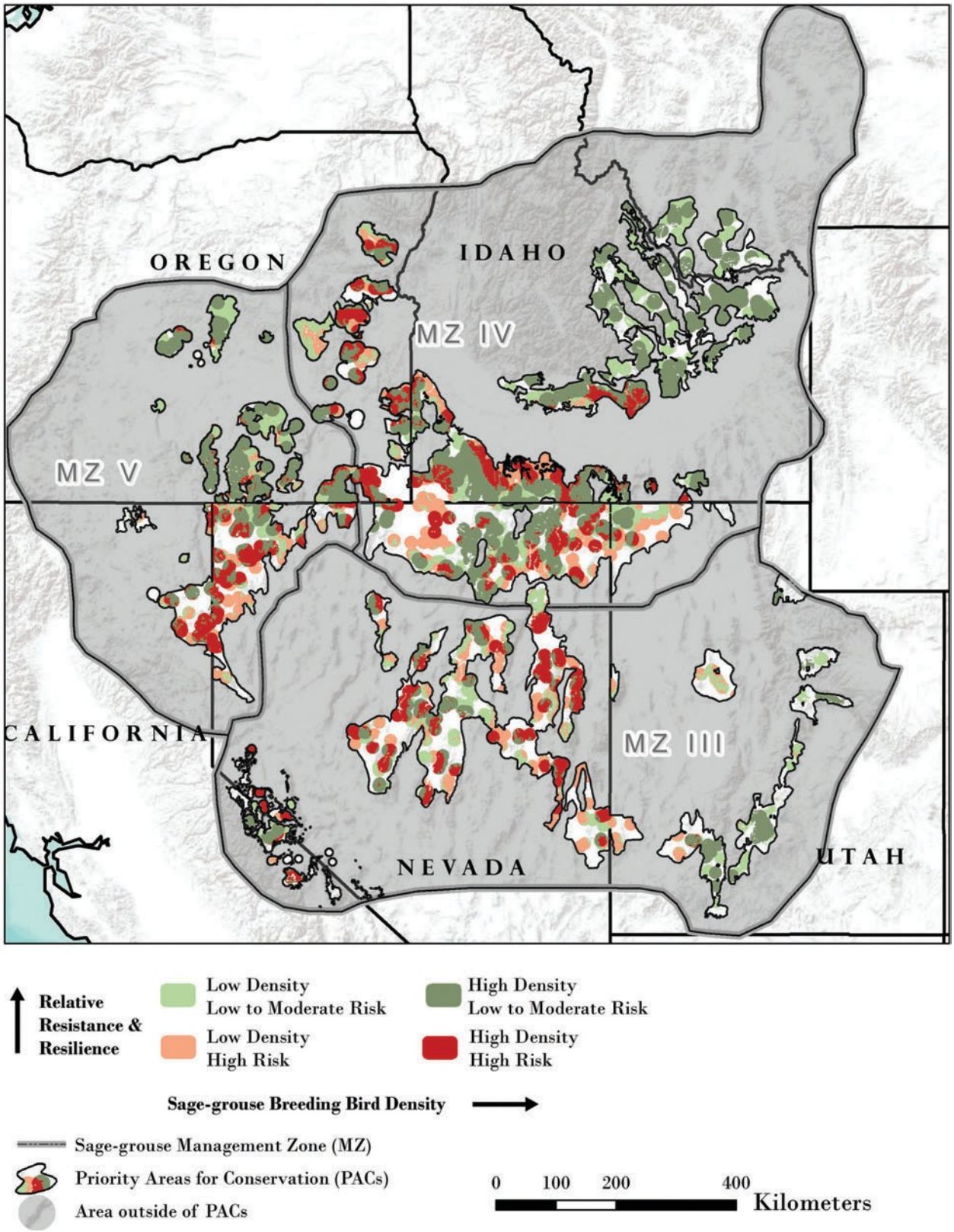

Figure 26. Sage-grouse breeding bird densities (Doherty et al. 2010) for high breeding bird densities (areas that contain 75% of known breeding bird populations) and low breeding bird densities (areas that contain all remaining breeding bird populations) relative to resilience and resistance within sage-grouse Management Zones III, IV, and V (Stiver et al. 2006). Relative resilience and resistance groups are derived from soil moisture and temperature classes (Soil Survey Staff 2014a, b) as described in text, and indicate risk of invasive annual grasses and wildfire. Lighter colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

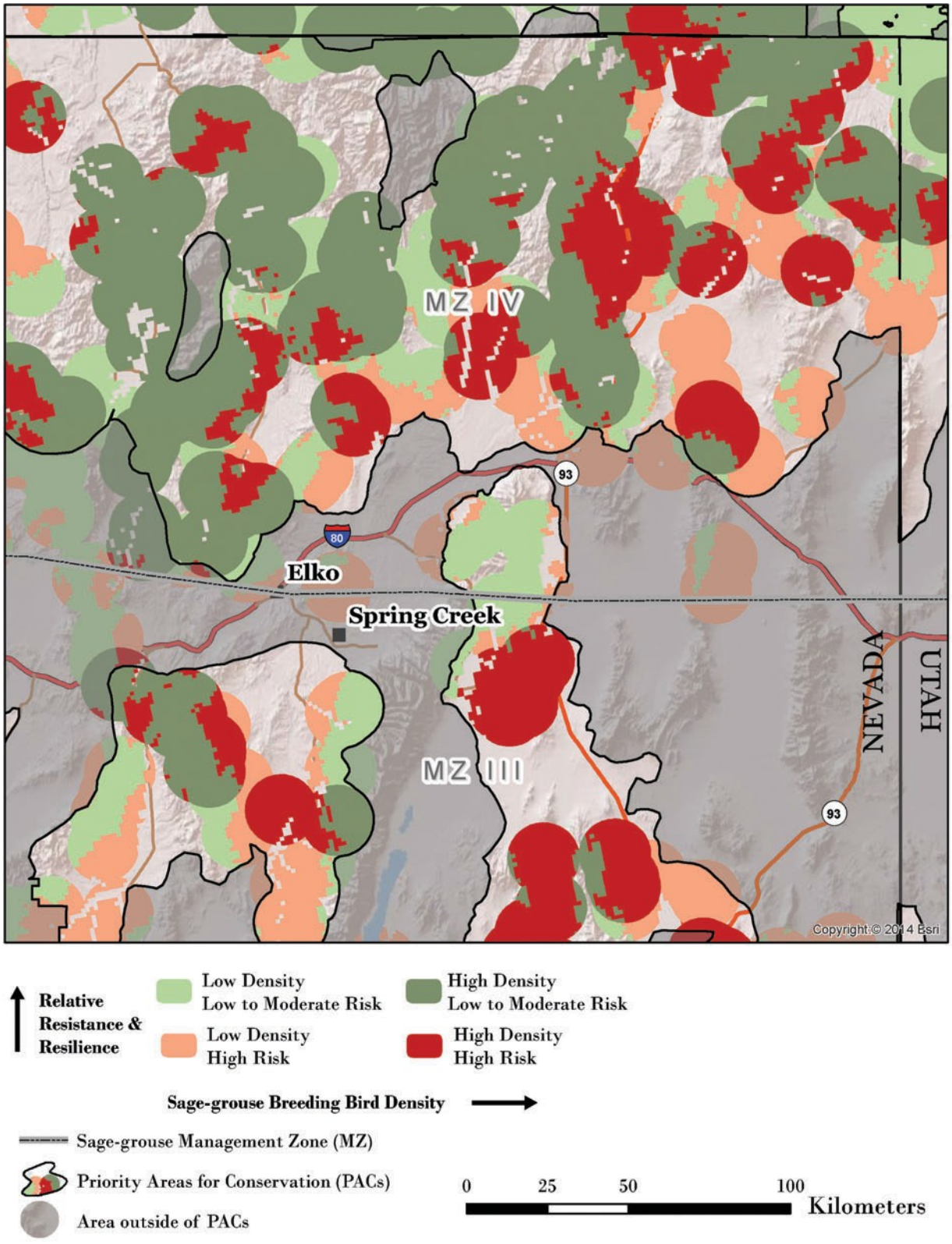

Figure 27. Sage-grouse breeding bird densities (Doherty et al. 2010) for high breeding bird densities (areas that contain 75% of known breeding bird populations) and low breeding bird densities (areas that contain all remaining breeding bird populations) relative to resilience and resistance in the northeast corner of Nevada. Relative resilience and resistance groups are derived from soil moisture and temperature classes (Soil Survey Staff 2014a, b) as described in text, and indicate risk of invasive annual grasses and wildfire. Lighter colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

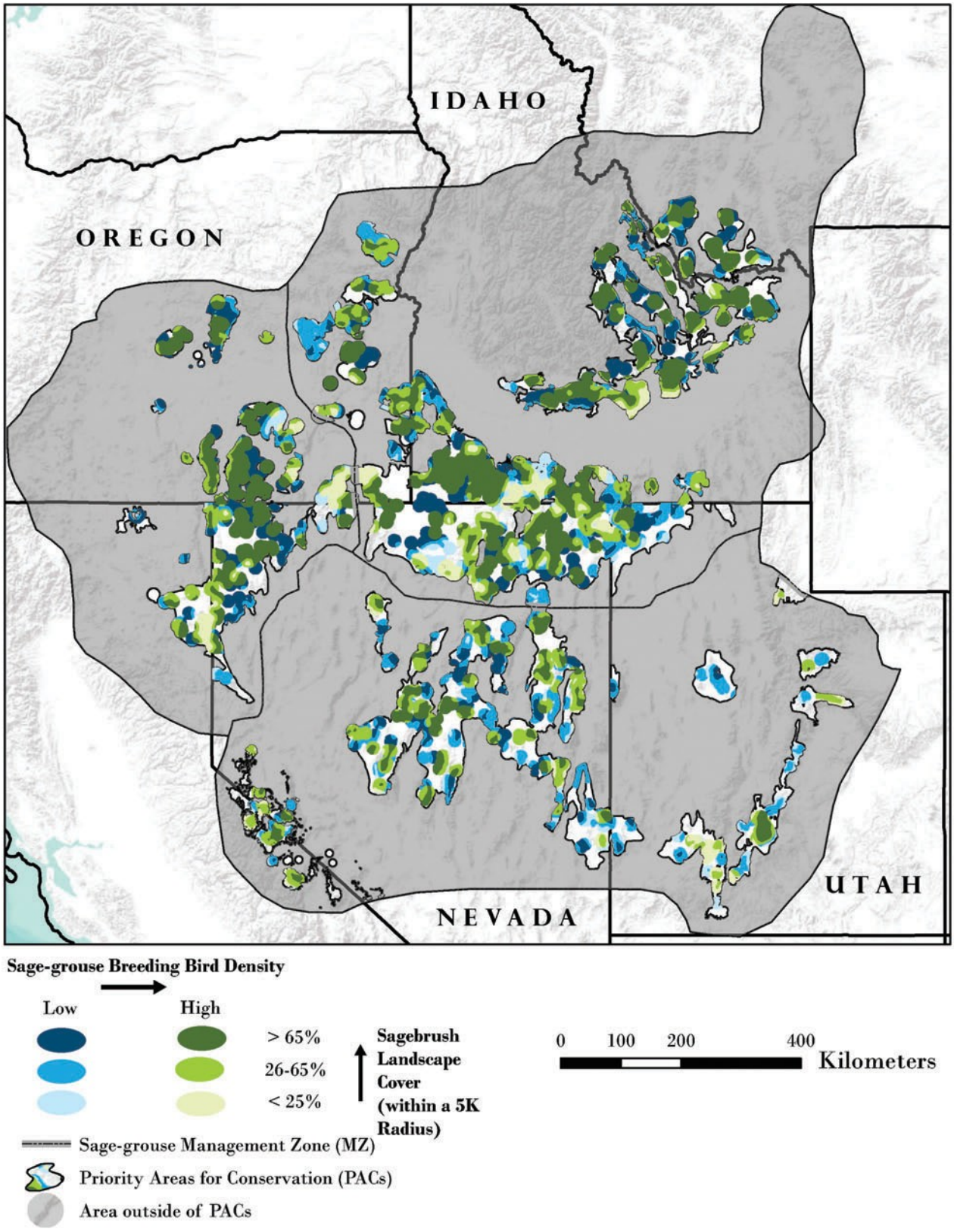

Figure 28. Sage-grouse breeding bird densities (Doherty et al. 2010) for high breeding bird densities (areas that contain 75% of known breeding bird populations) and low breeding bird densities (areas that contain all remaining breeding bird populations) relative to sagebrush cover. Lighter colored polygons within Management Zones delineate Priority Areas for Conservation (USFWS 2013).

Resilience and resistance and sagebrush cover combined with bird population density data provide land managers a way to evaluate trade-offs of particular management options at the landscape scale. For example, high density, low resilience and resistance landscapes with >65% sagebrush landscape cover may require immediate attention for conservation efforts because they currently support a high concentration of birds but have the lowest potential to recover to desired conditions post-fire and to resist invasive plants when disturbed. Similarly, high density but moderate-to-high resilience and resistance landscapes with 26-65% sagebrush cover may be priorities for preventative actions like conifer removal designed to increase the proportion of sagebrush cover and maintain ecosystem resilience and resistance. Mapping relative resilience and resistance and landscape cover of sagebrush for sage-grouse breeding areas should be viewed as a component of the assessment process that can help local managers allocate resources to accelerate planning and implementation.

Interpretations at the Management Zone (MZ) Scale: Western Portion of the Range

An examination of land cover and additional data layers for the western portion of the range reveals large differences among Management Zones (MZs) III, IV and V. MZs IV and V have larger areas with sagebrush cover >65% than MZ III (fig. 16). This may be partly explained by basin and range topography in MZ III, which is characterized by large differences in both environmental conditions and ecological types over relatively short distances. However, the cover of piñon and juniper in and adjacent to PACs in MZ III also is higher than in either MZ IV or V (fig. 22). The greater cover of piñon and juniper in MZ III appears to largely explain the smaller patches of sagebrush cover in the 26-65% and >65% categories.

Our capacity to quantify understory vegetation cover using remotely sensed data is currently limiting, but a visual examination of estimates for invasive annual grass (fig. 20; Peterson 2006, 2007) suggests a higher index (greater cover) in areas with relatively low resistance (warm soil temperatures) in all MZs (see fig. 18). This is consistent with current understanding of resistance to cheatgrass (Chambers et al. 2014; Chambers et al. *in press*). It is noteworthy that the invasive annual grass index is low for most of the central basin and range (central Nevada). Several factors may be contributing to the low index for this area including climate, the stage of piñon and juniper expansion and linked decrease in fire frequency, the relative lack of human development, and the relative lack of management treatments in recent decades (Wisdom et al. 2005; Miller et al. 2011). Not surprisingly, areas with a high annual grass index are outside or on the periphery of current PACs. However, it is likely that invasive annual grasses are present on many warmer sites and that they may increase following fire or other disturbances. In areas with low resistance to invasive annual grasses, they often exist in the understory of sagebrush ecosystems and are not detected by remote sensing platforms such as Landsat.

The number of hectares burned has been highest in MZ IV, adjacent areas in MZ V, and in areas with relatively low resilience and resistance in the northern portion of MZ III that have a high invasive annual grass index (figs. 18, 20, 24). A total of over 1.1 million hectares (2.7 million acres) burned in 2000 and 2006, while over 1.7 million hectares (4.2 million acres) burned in 2007 and 2012 and almost three quarters of these acres were in MZ IV (table 5). In some cases, these fires appear to be linked to the annual invasive grass index, but in others it clearly is not. At this point, there appears to be little relationship between cover of piñon and juniper and wildfire. Mega-fires comprised of hundreds of thousands of acres have burned in recent years, especially in MZ IV. These fires have occurred primarily in areas with low to moderate resilience and resistance and during periods with extreme burning conditions.

Table 5. The number of hectares (acres) burned in Management Zones III, IV, and V each year from 2000 to 2013.

Year	Management Zone III		Management Zone IV		Management Zone V		Total	
2000	155,159	(383,405)	868,118	(2,145,165)	88,871	(219,606)	1,112,148	(2,748,176)
2001	164,436	(406,330)	272,870	(674,276)	141,454	(349,541)	578,760	(1,430,147)
2002	85,969	(212,433)	100,308	(247,867)	113,555	(280,601)	299,833	(740,902)
2003	21,869	(54,038)	127,028	(313,892)	27,597	(68,192)	176,493	(436,123)
2004	20,477	(50,600)	11,344	(28,032)	13,037	(32,216)	44,858	(110,847)
2005	45,130	(111,520)	374,894	(926,382)	22,039	(54,458)	442,063	(1,092,360)
2006	198,762	(491,150)	860,368	(2,126,014)	117,452	(290,230)	1,176,582	(2,907,394)
2007	371,154	(917,140)	1,240,303	(3,064,853)	134,520	(332,406)	1,745,977	(4,314,399)
2008	14,015	(34,632)	109,151	(269,717)	43,949	(108,599)	167,115	(412,949)
2009	43,399	(107,242)	12,250	(30,271)	47,918	(118,408)	103,568	(255,921)
2010	31,597	(78,078)	280,662	(693,531)	21,940	(54,216)	334,200	(825,825)
2011	83,411	(206,114)	283,675	(700,977)	22,909	(56,608)	389,995	(963,699)
2012	203,680	(503,303)	946,514	(2,338,885)	574,308	(1,419,144)	1,724,501	(4,261,331)
2013	45,976	(113,610)	368,434	(910,419)	15,852	(39,170)	430,262	(1,063,199)
Total	1,485,034	(3,669,595)	5,855,920	(14,470,281)	1,385,400	(3,423,396)	8,726,354	(21,563,271)

Coupling breeding bird densities with landscape cover of sagebrush indicates that populations with low densities tend to occur in areas where sagebrush cover is in the 26-65% category, and few populations occur in areas with <25% sagebrush cover (fig. 27) (Knick et al. 2013). Combining the breeding bird densities with resilience and resistance indicates significant variability in risks among high density populations within PACs (fig. 26). A large proportion of remaining high density centers within PACs occurs on moderate-to-high resilience and resistance habitats, while low density/low resilience and resistance areas tend to occur along the periphery of PACs or are disproportionately located in MZ III and southern parts of MZ V.

Examination of other data layers suggests that different wildfire and invasive species threats exist across the western portion of the range, and that management should target the primary threats to sage-grouse habitat within focal areas. In MZs IV and V invasive annual grasses—especially on the periphery of the PACs—and wildfire are key threats. However, recent wildfires are not necessarily linked to invasive annual grasses. This suggests that management strategies for these MZs emphasize fire operations, fuels management focused on decreasing fire spread, and integrated strategies to control annual grasses and increase post-fire rehabilitation and restoration success. Differences in piñon and/or juniper landscape cover exist among MZs with 5,131,900 ha (12,681,202 ac) in MZ III, 528,377ha (1,305,649 ac) in MZ IV, and 558,880 ha (1,381,024 ac) in MZ V. Portions of MZs IV and V are still largely in early stages of juniper expansion indicating a need to address this threat before woodland succession progresses. Because of generally low resilience and resistance in MZ III, greater emphasis is needed on habitat conservation, specifically minimizing or eliminating stressors. Also, greater emphasis on reducing cover of piñon and juniper is needed to reduce woody fuels and increase sagebrush ecosystem resilience to fire by increasing the recovery potential of native understory species.

Interpretations at Regional and Local Land Management Scales: Northeast Nevada Example

The same land covers and data layers used to assess focal areas for sage-grouse habitat within MZs in the western portion of the species range can be used to evaluate focal areas for management in regional planning areas and land management planning units. The emphasis at the scale of the land planning area or management planning unit is on maintaining or increasing large contiguous areas of sagebrush habitat with covers in the 26-65% and especially >65% category. Resilience to disturbance and resistance to invasive annual grasses as indicated by soil temperature and moisture regimes is used to determine the most appropriate activities within the different cover categories. The sage-grouse habitat matrix in table 2 describes the capacity of areas with differing resilience and resistance to recover following disturbance and resist annual invasive grasses and provides the management implications for each of the different cover categories. Table 4 provides potential management strategies for the different sagebrush cover and resilience and resistance categories (cells) in the sage-grouse habitat matrix by agency program areas (fire operations, fuels management, post-fire rehabilitation, habitat restoration). Note that the guidelines in table 4 are related to the sage-grouse habitat matrix, and do not preclude other factors from consideration when determining management priorities for program areas.

Here, we provide an example of how to apply the concepts and tools discussed in this report by examining an important region identified in the MZ scale assessment. The northeastern corner of Nevada was selected to illustrate the diversity of sage-grouse habitat within planning areas and the need for proactive collaboration both within agencies and across jurisdictional boundaries in devising appropriate management strategies (figs. 17, 19, 21, 23, 25). This part of Nevada has large areas of invasive annual grasses and areas with piñon and juniper expansion, and it has experienced multiple large fires in the last decade. It includes a BLM Field Office, Forest Service (FS) land, State land, multiple private owners, and borders two States (fig. 29), which results in both complex ownership and natural complexity.

In the northeast corner of Nevada, an area 5,403,877 ha (13,353,271 ac) in size, numerous large fires have burned in and around PACs (fig. 25). Since 2000, a total of 1,144,317 ha (2,827,669 ac) have burned with the largest fires occurring in 2000, 2006, and 2007. This suggests that the primary management emphasis be on retaining existing areas of sagebrush in the 26-65% and especially >65% categories and promoting recovery of former sagebrush areas that have burned. Fire suppression in and around large, contiguous areas of sagebrush and also in and around successful habitat restoration or post-fire rehabilitation treatments is a first order priority. Fuels management also is a high priority and is focused on strategic placement of fuel breaks to reduce loss of large sagebrush stands by wildfire without jeopardizing existing habitat quality. Also, in the eastern portion of the area, piñon and juniper land cover comprises 471,645 ha (1,165,459 ac) (fig. 23). In this area, management priorities include (1) targeted tree removal in early to mid-phase (Phase I and II), post-settlement piñon and juniper expansion areas to maintain shrub/herbaceous cover and reduce fuel loads, and (2) targeted tree removal in later phase (Phase III) post-settlement piñon and juniper areas to reduce risk of high severity fire. In areas with moderate to high resilience and resistance, post-fire rehabilitation focuses on accelerating sagebrush establishment and recovery of perennial native herbaceous species. These areas often are capable of unassisted recovery and seeding is likely needed only in areas where perennial native herbaceous species have been depleted (Miller et al. 2013). Seeding introduced species can retard recovery of native perennial grasses and forbs that are important to sage-grouse and should be avoided in these areas (Knutson et al. 2014). Seeding or transplanting of sagebrush may be needed to accelerate establishment in focal areas.

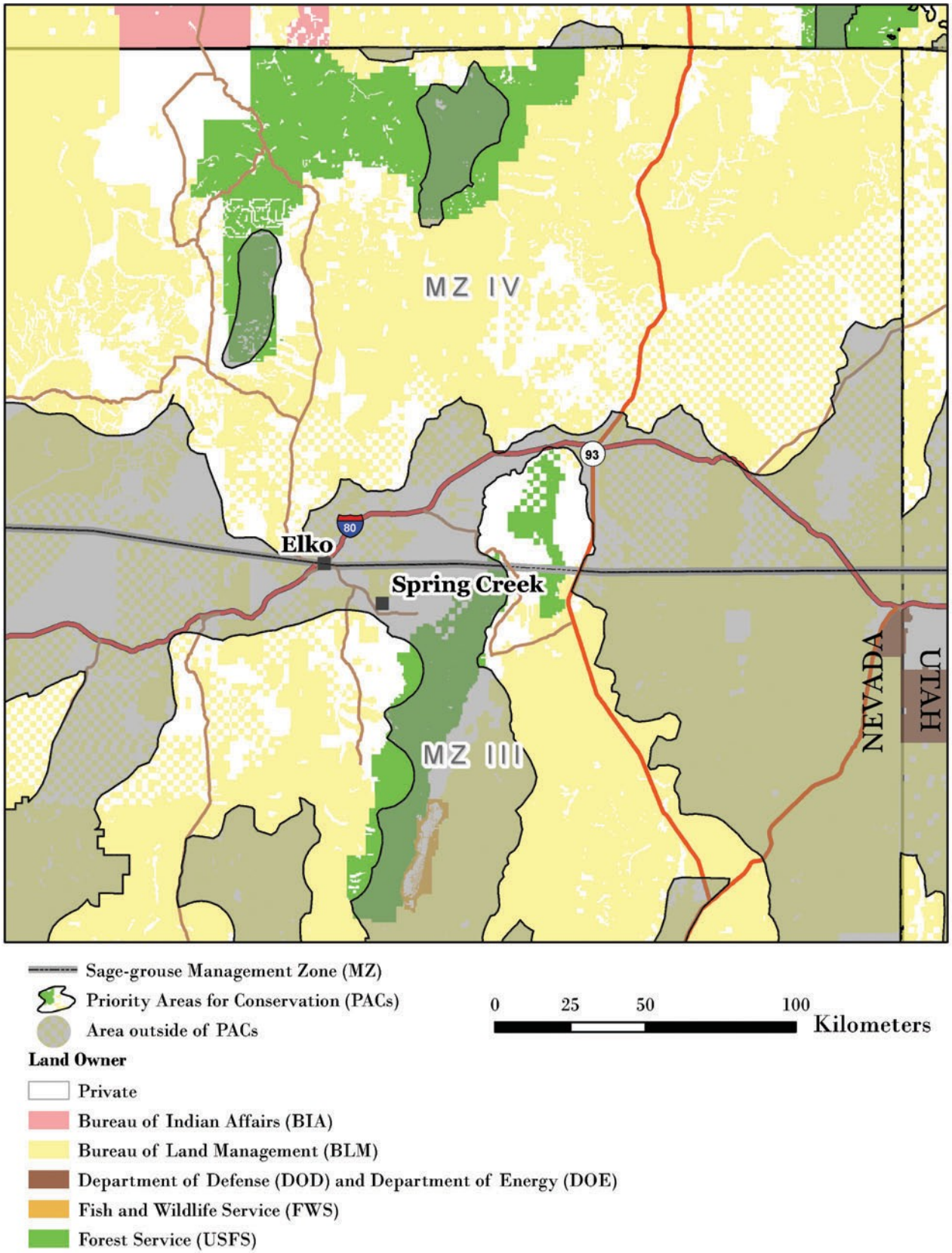

Figure 29. Land ownership for the northeast corner of Nevada. Lighter colored polygons delineate Priority Areas for Conservation (USFWS 2013).

In areas with lower resilience and resistance and high breeding bird densities, large, contiguous areas of sagebrush with intact understories are a high priority for conservation (figs. 17, 19, 27). In these areas, emphasis is on maintaining or increasing habitat conditions by minimizing stressors and disturbance. Post-fire rehabilitation and restoration activities focus on areas that increase connectivity among existing large areas of sagebrush. Because of low and variable precipitation, more than one intervention may be required to achieve restoration or rehabilitation goals. Appropriately managing livestock, wild horse and burro use (if applicable), and recreational use in focal areas is especially important to promote native perennial grass and forb growth and reproduction and to maintain or enhance resilience and resistance.

Determining the Most Appropriate Management Treatments at the Project Scale

Once focal areas and management priorities have been determined, potential treatment areas can be assessed to determine treatment feasibility and appropriate treatment methods. Different treatment options exist (figs. 30, 31) that differ in both suitability for a focal area and likely effectiveness. Field guides for sagebrush ecosystems and piñon and juniper expansion areas that incorporate resilience and resistance concepts are being developed to help guide managers through the process of determining both the suitability of an area for treatment and the most appropriate treatment. These guides are aligned with the different program areas and emphasize (1) fuel treatments (Miller et al. 2014a), (2) post-fire rehabilitation (Miller et al. 2014b), and (3) restoration (Pyke et al., in preparation). Additional information on implementing these types of management treatments is synthesized in Monsen et al. (2004) and Pyke (2011); additional information on treatment response is synthesized in Miller et al. (2013). In this section, we summarize the major steps in the process for determining the suitability of an area for treatment and the most appropriate treatment. We then provide an overview of two of the primary tools in the assessment process – ecological site descriptions (ESDs) and state and transition models (STMs). We conclude with a discussion of the importance of monitoring and adaptive management.

Steps in the process*:* Logical steps in the process of determining the suitability of an area for treatment and the most appropriate treatment(s) include (1) assessing the potential treatment area and identifying ecological sites, (2) determining the current successional state of the site, (3) selecting the appropriate action(s), and (4) monitoring and evaluation to determine post-treatment management. A general approach that uses questions to identify the information required in each step was developed (table 6). These questions can be modified to include the specific information needed for each program area and for treating different ecological sites. This format is used in the field guides described above.

Figure 30. Common vegetation treatments for sagebrush dominated ecosystems with relatively low resilience and resistance include seeding after wildfire in areas that lack sufficient native perennial grasses and forbs for recovery (top) (photo by Chad Boyd), and mowing sagebrush to reinvigorate native perennial grasses and forbs in the understory (bottom) (photo by Scott Schaff). Success of mowing treatments depends on having adequate perennial grasses and forbs on the site to resist invasive annual grasses and to promote recovery.

Figure 31. Vegetation treatments for sagebrush ecosystems exhibiting piñon and juniper expansion include cutting the trees with chainsaws and leaving them in place (top) (photo by Jeremy Roberts) and shredding them with a “bullhog” (middle) (photo by BruceA. Roundy) on sites with relatively warm soils and moderately low resistance to cheatgrass. Prescribed fire (bottom) (photo by Jeanne C. Chambers) can be a viable treatment on sites with relatively cool and moist soils that have higher resilience to disturbance and resistance to invasive annual grasses. Treatment success depends on having adequate perennial grasses and forbs on the site to resist invasive annual grasses and promote recovery and will be highest on sites with relatively low densities of trees (Phase I to Phase II woodlands).

Table 6. General guidelines for conducting fuels management, fire rehabilitation, and restoration treatments (modified from Miller et al. 2007; Tausch et al. 2009; Pyke 2011; Chambers et al. 2013).

Steps in the process	Questions and considerations
I. Assess potential treatment area and identify ecological sites	1. Where are priority areas for fuels management, fire rehabilitation or restoration within the focal area? Consider sage-grouse habitat needs and resilience and resistance. 2. What are the topographic characteristics and soils of the area? Verify soils mapped to the location and determine soil temperature/moisture regimes. Collect information on soil texture, depth and basic chemistry for restoration projects. 3. How will topographic characteristics and soils affect vegetation recovery, plant establishment and erosion? Evaluate erosion risk based on topography and soil characteristics. 4. What are the potential native plant communities for the area? Match soil components to their correlated ESDs. This provides a list of potential species for the site(s).
II. Determine current state of the site	5. Is the area still within the reference state for the ecological site(s)?
III. Select appropriate action	6. How far do sites deviate from the reference state? How will treatment success be measured? 7. Do sufficient perennial shrubs and perennial grasses and forbs exist to facilitate recovery? 8. Are invasive species a minor component? 9. Do invasive species dominate the sites while native life forms are missing or severely under represented? If so, active restoration is required to restore habitat. 10. Are species from drier or warmer ecological sites present? Restoration with species from the drier or warmer sites should be considered. 11. Have soils or other aspects of the physical environment been altered? Sites may have crossed a threshold and represent a new ecological site type requiring new site-specific treatment/restoration approaches.
IV. Determine post-treatment management	12. How long should the sites be protected before land uses begin? In general, sites with lower resilience and resistance should be protected for longer periods. 13. How will monitoring be performed? Treatment effectiveness monitoring includes a complete set of measurements, analyses, and a report. 14. Are adjustments to the approach needed? Adaptive management is applied to future projects based on consistent findings from multiple locations.

Ecological site descriptions: ESDs and their associated STMs provide essential information for determining treatment feasibility and type of treatment. ESDs are part of a land classification system that describes the potential of a set of climate, topographic, and soil characteristics and natural disturbances to support a dynamic set of plant communities (Bestelmeyer et al. 2009; Stringham et al. 2003). NRCS soil survey data (http://soils.usda.gov/survey/), including soil temperature/moisture regimes and other soil characteristics, are integral to ESD development. ESDs have been developed by the NRCS and their partners to assist land management agencies and private land owners with making resource decisions, and are widely available for the Sage-grouse MZs except where soil surveys have not been completed (for a detailed description of ESDs and access to available ESDs see: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/ecoscience/desc/). ESDs assist managers to step-down generalized vegetation dynamics, including the concepts of resilience and resistance, to local scales. For example, variability in soil characteristics and the local environment (e.g., average annual precipitation as indicated by soil moisture regime) can strongly influence both plant community resilience to fire as well as the resistance of a plant community to invasive annual grasses after fire (table 1). Within a particular ESD, there is a similar level of resilience to disturbance and resistance to invasive annuals and this information can be used to determine the most appropriate management actions.

State and transition models: STMs are a central component of ecological site descriptions that are widely used by managers to illustrate changes in plant communities and associated soil properties, causes of change, and effects of management interventions (Stringham et al. 2003; Briske et al. 2005; USDA NRCS 2007) including in sagebrush ecosystems (Forbis et al. 2006; Barbour et al. 2007; Boyd and Svejcar 2009; Holmes and Miller 2010; Chambers et al. *in press*). These models use ***state*** (a relatively stable set of plant communities that are resilient to disturbance) and ***transition*** (the drivers of change among alternative states) to describe the range in composition and function of plant communities within ESDs (Stringham and others 2003; see Appendix 1 for definitions). The reference state is based on the natural range of conditions associated with natural disturbance regimes and often includes several plant communities (***phases***) that differ in dominant plant species relative to type and time since disturbance (Caudle et al. 2013). Alternative states describe new sets of communities that result from factors such as inappropriate livestock use, invasion by annual grasses, or changes in fire regimes. Changes or transitions among states often are characterized by ***thresholds*** that may persist over time without active intervention, potentially causing irreversible changes in community composition, structure, and function. ***Restoration pathways*** are used to identify the environmental conditions and management actions required for return to a previous state. Detailed STMs that follow current interagency guidelines (Caudle et al. 2013), are aligned with the ecological types (table 1), and are generally applicable to MZs III (Southern Great Basin), IV (Snake River Plains), V (Northern Great Basin), and VI (Columbia Basin) are provided in Appendix 5.

A generalized STM to illustrate the use of STMs is shown in figure 32 for the warm and dry Wyoming big sagebrush ecological type. This ecological type occurs at relatively low elevations in the western part of the range and has low to moderate resilience to disturbance and management treatments and low resistance to invasion (table 1). This type is abundant in the western portion of the range, but as the STM suggests, it is highly susceptible to conversion to invasive annual grass and repeated fire and is difficult to restore. Intact sagebrush areas remaining in the reference state within this ecological type are a high priority for conservation. Invaded states or locations with intact sagebrush that lack adequate native perennial understory are a high priority for restoration where they bridge large, contiguous areas of sagebrush. However, practical methods to accomplish this are largely experimental and/or costly and further development, including adaptive science and management, is needed.

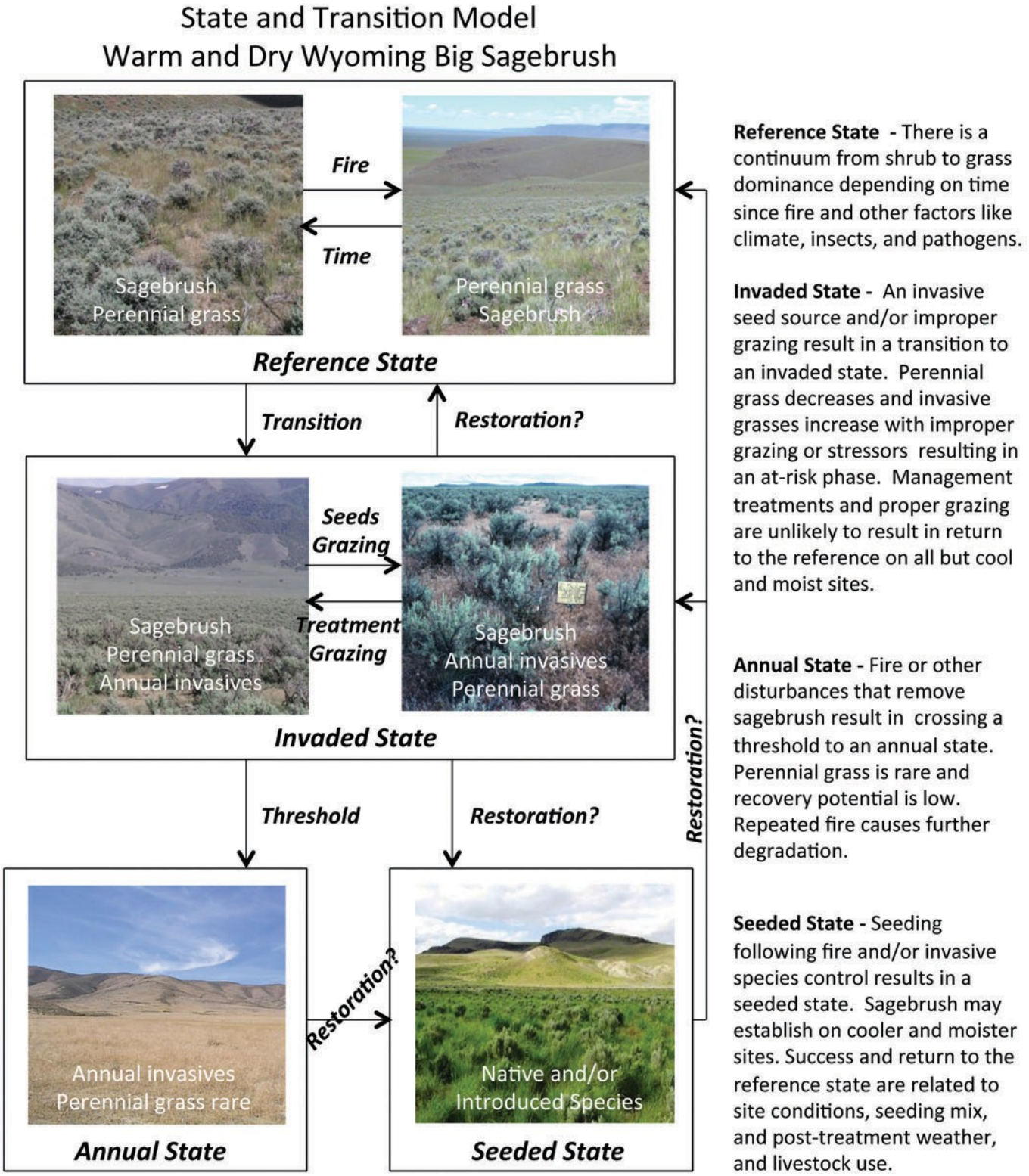

Figure 32. A state and transition model that illustrates vegetation dynamics and restoration pathways for the warm and dry, Wyoming big sagebrush ecological type. This ecological type occurs at relatively low elevations in the western part of the range and has low to moderate resilience to disturbance and management treatments and low resistance to invasion.

Monitoring and adaptive management: Monitoring programs designed to track ecosystem changes in response to both stressors and management actions can be used to increase understanding of ecosystem resilience and resistance, realign management approaches and treatments, and implement adaptive management (Reever-Morghan et al. 2006; Herrick et al. 2012). Information is increasing on likely changes in sagebrush ecosystems with additional stress and climate warming, but a large degree of uncertainty still exits. Currently, the NRCS National Resource Inventory is being used on private lands and is being implemented on public lands managed by BLM to monitor trends in vegetation attributes and land health at the landscape scale under the AIM (Assessment Inventory and Monitoring) strategy. Strategic placement of monitoring sites and repeated measurements of ecosystem status and trends (e.g., land cover type, ground cover, vegetation cover and height of native and invasive species, phase of tree expansion, soil and site stability, oddities) can be used to decrease uncertainty and increase effectiveness of management decisions. Ideally, monitoring sites span environmental/productivity gradients and sagebrush ecological types that characterize sage-grouse habitat. Of particular importance are (1) ecotones between ecological types where changes in response to climate are expected to be largest (Loehle 2000; Stohlgren et al. 2000), (2) ecological types with climatic conditions and soils that are exhibiting invasion and repeated fires, and (3) ecological types with climatic conditions and soils that are exhibiting tree expansion and increased fire risk. Monitoring the response of sagebrush ecosystems to management treatments, including both pre- and post-treatment data, is a first order priority because it provides information on treatment effectiveness that can be used to adjust methodologies.

Monitoring activities are most beneficial when consistent approaches are used among and within agencies to collect, analyze, and report monitoring data. Currently, effectiveness monitoring databases that are used by multiple agencies do not exist. However, several databases have been developed for tracking fire-related and invasive-species management activities. The National Fire Plan Operations and Reporting System (NFPORS) is an interdepartmental and interagency database that accounts for hazardous fuel reduction, burned area rehabilitation and community assistance activities. To our knowledge, NFPORS is not capable of storing and retrieving the type of effectiveness monitoring information that is needed for adaptive management. The FEAT FIREMON Integrated (FFI; https://www.frames.gov/partner-sites/ffi/ffi-home/) is a monitoring software tool designed to assist managers with collection, storage and analysis of ecological information. It was constructed through a complementary integration of the Fire Ecology Assessment Tool (FEAT) and FIREMON. This tool allows the user to select among multiple techniques for effectiveness monitoring. If effectiveness monitoring techniques were agreed on by the agencies, FFI does provide databases with standard structures that could be used in inter-agency effectiveness monitoring. Also, the National Invasive Species Information Management System (NISIMS) is designed to reduce redundant data entry regarding invasive species inventory, management and effectiveness monitoring with the goal of providing information that can be used to determine effective treatments for invasive species. However, NISIMS is currently available only within the BLM.

Common databases can be used by agency partners to record and share monitoring data. The Land Treatment Digital Library (LTDL [USGS 2010]) provides a method of archiving and collecting common information for land treatments and might be used as a framework for data storage and retrieval. Provided databases are relational (maintain a common field for connecting them), creating single corporate databases is not necessary. However, barriers that hinder database access within and among agencies and governmental departments may need to be lowered while still maintaining adequate data security. The LTDL has demonstrated how

this can work by accessing a variety of databases to populate useful information relating to land treatments.

For effectiveness of treatments to be easily useable for adaptive management, the agencies involved will need to agree on monitoring methods and a common data storage and retrieval system. Once data can be retrieved, similar treatment projects can be evaluated to determine how well they achieve objectives for sage-grouse habitat, such as the criteria outlined in documents like the Habitat Assessment Framework (Stiver et al. 2006). Results of monitoring activities on treatment effectiveness are most useful when shared across jurisdictional boundaries, and several mechanisms are currently in place to improve information sharing (e.g., the Great Basin Fire Science Delivery Project; www.gbfiresci.org).

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Appendix 1. Definitions of Terms Used in This Document

At-Risk Community Phase — A community phase that can be designated within the reference state and also in alternative states. This community phase is the most vulnerable to transition to an alternative state (Caudle et al. 2013).

Community Phase — A unique assemblage of plants and associated soil properties that can occur within a state (Caudle et al. 2013).

Ecological Site (ES) — An Ecological Site (ES) is a conceptual division of the landscape that is defined as a distinctive kind of land based on recurring soil, landform, geological, and climate characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its ability to respond similarly to management actions and natural disturbances (Caudle et al. 2013).

Ecological Site Descriptions (ESD) — The documentation of the characteristics of an ecological site. The documentation includes the data used to define the distinctive properties and characteristics of the ecological site; the biotic and abiotic characteristics that differentiate the site (i.e., climate, topography, soil characteristics, plant communities); and the ecological dynamics of the site that describes how changes in disturbance processes and management can affect the site. An ESD also provides interpretations about the land uses and ecosystem services that a particular ecological site can support and management alternatives for achieving land management (Caudle et al. 2013).

Ecological Type — A category of land with a distinctive (i.e., mappable) combination of landscape elements. The elements making up an ecological type are climate, geology, geomorphology, soils, and potential natural vegetation. Ecological types differ from each other in their ability to produce vegetation and respond to management and natural disturbances (Caudle et al. 2013).

Historical Range of Variability — Range of variability in disturbances, stressors, and ecosystem attributes that allows for maintenance of ecosystem resilience and resistance and that can be used to provide management targets (modified from Jackson 2006).

Resilience — Ability of a species and/or its habitat to recover from stresses and disturbances. Resilient ecosystems regain their fundamental structure, processes, and functioning when altered by stresses like increased CO_2 , nitrogen deposition, and drought and to disturbances like land development and fire (Allen et al. 2005; Holling 1973).

Resistance — Capacity of an ecosystem to retain its fundamental structure, processes and functioning (or remain largely unchanged) despite stresses, disturbances, or invasive species (Folke et al. 2004).

Resistance to Invasion — Abiotic and biotic attributes and ecological processes of an ecosystem that limit the population growth of an invading species (D'Antonio and Thomsen 2004**)**.

Restoration Pathways — Restoration pathways describe the environmental conditions and practices that are required for a state to recover that has undergone a transition (Caudle et al. 2013).

State — A state is a suite of community phases and their inherent soil properties that interact with the abiotic and biotic environment to produce persistent functional and structural attributes associated with a characteristic range of variability (adapted from Briske et al. 2008).

State-and-Transition Model — A method to organize and communicate complex information about the relationships between vegetation, soil, animals, hydrology, disturbances (fire, lack of fire, grazing and browsing, drought, unusually wet periods, insects and disease), and management actions on an ecological site (Caudle et al. 2013).

Thresholds — Conditions sufficient to modify ecosystem structure and function beyond the limits of ecological resilience, resulting in the formation of alternative states (Briske et al. 2008).

Transition — Transitions describe the biotic or abiotic variables or events, acting independently or in combination, that contributes directly to loss of state resilience and result in shifts between states. Transitions are often triggered by disturbances, including natural events (climatic events or fire) and/or management actions (grazing, burning, fire suppression). They can occur quickly as in the case of catastrophic events like fire or flood, or over a long period of time as in the case of a gradual shift in climate patterns or repeated stresses like frequent fires (Caudle et al. 2013).

Appendix 2. An Explanation of the Use of Landscape Measures to Describe Sagebrush Habitat

Understanding landscape concepts of plant cover relative to typical management unit concepts of plant cover is important for prioritizing lands for management of sage-grouse. Ground cover measurements of sagebrush made at a management unit (for example, line-intercept measurements) should not be confused for landscape cover and may not relate well to landscape cover since the areas of examination differ vastly (square meters for management units and square kilometers for landscapes).

A landscape is defined rather arbitrarily as a large area in total spatial extent, somewhere in size between sites (acres or square miles) and regions (100,000s of square miles). The basic unit of a landscape is a patch, which is defined as a bounded area characterized by a similar set of conditions. A habitat patch, for example, may be the polygonal area on a map representing a single land cover type. Landscapes are composed of a mosaic of patches. The arrangement of these patches (the landscape configuration or pattern) has a large influence on the way a landscape functions and for landscape species, such as sage-grouse, sagebrush habitat patches are extremely important for predicting if this bird will be present within the area (Connelly et al. 2011).

Remotely sensed data of land cover is typically used to represent landscapes. These data may combine several sources of data and may include ancillary data, such as elevation, to improve the interpretation of data. These data are organized into pixels that contain a size or grain of land area. For example, LandSat Thematic Mapper spectral data used in determining vegetation cover generally have pixels that represent ground areas of 900 m^2 (30- x 30-m). Each pixel's spectral signature can be interpreted to determine what type of vegetation dominates that pixel. Groups of adjacent pixels with the same dominant vegetation are clustered together into polygons that form patches.

Landscape cover of sagebrush is determined initially by using this vegetation cover map, but a 'rolling window' of a predetermined size (e.g., 5 km^2 or 5,556 pixels that are 30- by 30-m in size) is moved across the region one pixel at a time. The central pixel of the 'window' is reassigned a value for the proportion of pixels where sagebrush is the dominant vegetation. The process is repeated until pixels within the region are completely reassigned to represent the landscape cover of sagebrush within for the region drawn from a 5 km^2 window.

Appendix 3. An Explanation of Soil Temperature and Moisture Regimes Used to Describe Sagebrush Ecosystems

Soil climate regimes (temperature and moisture) are used in Soil Taxonomy to classify soils; they are important to consider in land management decisions, in part, because of the significant influence on the amounts and kinds of vegetation that soils support. Soil temperature and moisture regimes are assigned to soil map unit components as part of the National Cooperative Soil Survey program. Soil survey spatial and tabular data for the Sage-grouse Management Zones (Stiver et al. 2006) were obtained for each State within the zones at the Geospatial Data Gateway (http://datagateway.nrcs.usda.gov/). Gridded Soil Survey Geographic (gSSURGO) file geodatabases were used to display a 10-meter raster dataset. Multiple soil components made up a soil map unit, and soil moisture and temperature regimes were linked to individual soil map components. Soil components with the same soil moisture and temperature class regime were aggregated, and the dominant soil moisture and temperature regime within each soil map unit was used to characterize the temperature and moisture regime. Only temperature and moisture regimes applicable to sagebrush ecosystems were displayed.

Abbreviated definitions of each soil temperature and moisture regime class are listed below. Complete descriptions can be found in *Keys to Soil Taxonsomy, 11th edition*, available at ftp://ftp-fc.sc.egov.usda.gov/NSSC/Soil_Taxonomy/keys/2010_Keys_to_Soil_Taxonomy.pdf.

Soil temperature regimes	
Cryic (Cold)	Soils that have a mean annual soil temperature of <8 °C, and do not have permafrost, at a depth of 50 cm below the surface or at a restrictive feature, whichever is shallower.
Frigid (Cool)	Soils that have a mean annual soil temperature of <8 °C and the difference between mean summer and mean winter soil temperatures is >6 °C at a depth of 50 cm below the surface or at a restrictive feature, whichever is shallower.
Mesic (Warm)	Soils that have a mean annual soil temperature of 8-15 °C and the difference between mean summer and mean winter soil temperatures is >6 °C at a depth of 50 cm below the surface or at a restrictive feature, whichever is shallower.
Soil moisture regimes	
Ustic (summer precipitation)	Generally there is some plant-available moisture during the growing season, although significant periods of drought may occur. Summer precipitation allows presence of warm season plant species.
Xeric (Moist; generally mapped at >12 inches mean annual precipitation)	Characteristic of arid regions. The soil is dry for at least half the growing season and moist for less than 90 consecutive days.
Aridic (Dry; generally mapped at <12 inches mean annual precipitation)	Characteristic of arid regions. The soil is dry for at least half the growing season and moist for less than 90 consecutive days.

Note: Soil moisture regimes are further divided into moisture subclasses, which are often used to indicate soils that are transitional to another moisture regime. For example, a soil with an Aridic moisture regime and a Xeric moisture subclass may be described as "Aridic bordering on Xeric." Understanding these gradients becomes increasingly important when making interpretations and decisions at the site scale where aspect, slope, and soils affect the actual moisture regime on that site. More information on taxonomic moisture subclasses is available at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053576.

Appendix 4. Data Sources for the Maps in This Report

Dataset	Citation	Link
Geomac fire perimeters	Walters, S.P.; Schneider, N.J.; Guthrie, J.D. 2011. Geospatial Multi-Agency Coordination (GeoMAC) wildland fire perimeters, 2008. Data Series 612. Washington, DC: U.S. Department of the Interior, U.S. Geological Survey.6 p.	http://pubs.er.usgs.gov/publication/ds612
WFDSS fire perimeters	Butler, B. B.; Bailey, A. 2013. Disturbance history (Historical wildland fires). Updated 8/9/2013. Wildland Fire Decision Support System. Online: https://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml [Accessed 5 March 2014].	https://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml or https://wfdss.usgs.gov/wfdss/WFDSSData_Downloads.shtml
Piñon and juniper land cover	U.S. Geological Survery (USGS) National Gap Analysis Program. 2004. Provisional digital land cover map for the southwestern United States. Version 1.0. Logan, UT: Utah State University, College of Natural Resources, RS/GIS Laboratory.	http://earth.gis.usu.edu/swgap/landcover.html
Piñon and juniper land cover	U.S. Geological Survey (USGS). 2013: LANDFIRE 1.2.0 Existing Vegetation Type layer. Updated 3/13/2013. Washington, DC: U.S. Department of the Interior, Geological Survey. Online: http://landfire.cr.usgs.gov/viewer/. [Accessed 13 March 2014].	http://www.landfire.gov/NationalProductDescriptions21.php
Nevada invasive annual grass index	Peterson, E. B. 2006. A map of invasive annual grasses in Nevada derived from multitemporal Landsat 5 TM imagery. Carson City, NV: State of Nevada, Department of Conservation and Natural Resources, Nevada Natural Heritage Program.	http://heritage.nv.gov/node/167
Owhyee upland annual grass index	Peterson, E. B. 2007. A map of annual grasses in the Owyhee Uplands, Spring 2006, derived from multitemporal Landsat 5 TM imagery. Carson City, NV: State of Nevada, Department of Conservation and Natural Resources, Nevada Natural Heritage Program.	http://heritage.nv.gov/sites/default/files/library/anngrowy_text_print.pdf
Soil data (SSURGO)	Soil Survey Staff. 2014a. Soil Survey Geographic (SSURGO) Database. United States Department of Agriculture, Natural Resources Conservation Service. Online: http://sdmdataaccess.nrcs.usda.gov/. [Accessed 3 March 2014a].	http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627
Soil data (STATSGO)	Soil Survey Staff. 2014b. U.S. General Soil Map (STATSGO2) Database. United States Department of Agriculture, Natural Resources Conservation Service. Online: http://sdmdataaccess.nrcs.usda.gov/. [Accessed 3 March 2014b].	

Soil temperature and moisture regime data	Campbell, S. B. 2014. Soil temperature and moisture regime data for the range of greater sage-grouse. Data product. Portland, OR: USDA Natural Resources Conservation Service. Online: https://www.sciencebase.gov/catalog/folder/537f8be5e4b021317a872f1b?community=LC+MAP+-+Landscape+Conservation+Management+and+Analysis+Portal [Accessed 17 June 2014].	https://www.sciencebase.gov/catalog/folder/537f8be5e4b021317a872f1b?community=LC+MAP+-+Landscape+Conservation+Management+and+Analysis+Portal
Sage-grouse management zones	Stiver, S. J.; Apa, A. D.; Bohne, J. R.; Bunnell, S. D.; Deibert, P. A.; Gardner, S. C.; Hilliard, M. A.; McCarthy, C. W.; Schroeder, M. A. 2006. Greater Sage-grouse Comprehensive Conservation Strategy. Unpublished report on file at: Western Association of Fish and Wildlife Agencies, Cheyenne, WY.	
Breeding bird densities	Doherty, K. E.; Tack, J. D.; Evans, J. S.; Naugle, D. E. 2010. Mapping breeding densities of greater sage-grouse: A tool for range-wide conservation planning. BLM completion report: Agreement # L10PG00911.	http://scholar.google.com/scholar?q=doherty+2010+breeding+bird&hl=en&as_sdt=0&as_vis=1&oi=scholart&sa=X&ei=JqQbU7HUAqfD2QW8xYFY&ved=0CCUQgQMwAA
Sagebrush land cover	U.S. Geological Survey (USGS). 2013: LANDFIRE 1.2.0 Existing Vegetation Type layer. Updated 3/13/2013. Washington, DC: U.S. Department of the Interior, Geological Survey. Online: http://landfire.cr.usgs.gov/viewer/. [Accessed 13 March 2014].	http://www.landfire.gov/NationalProductDescriptions21.php

Appendix 5. State-and-transition models (STMs) for five generalized ecological types for big sagebrush (from Chambers et al. *in press*; Miller et al. 2014 a, b)

These STMs represent groupings of ecological sites that are characterized by Wyoming or mountain big sagebrush, span a range of soil moisture/temperature regimes (warm/dry to cold/moist), and characterize a large portion of Management Zones III (Southern Great Basin), IV (Snake River Plains), V (Northern Great Basin), and VI (Columbia Basin). Large boxes illustrate states that are comprised of community phases (smaller boxes). Transitions among states are shown with arrows starting with T; restoration pathways are shown with arrows starting with R. The "at risk" community phase is most vulnerable to transition to an alternative state. Precipitation Zone is designated as PZ.

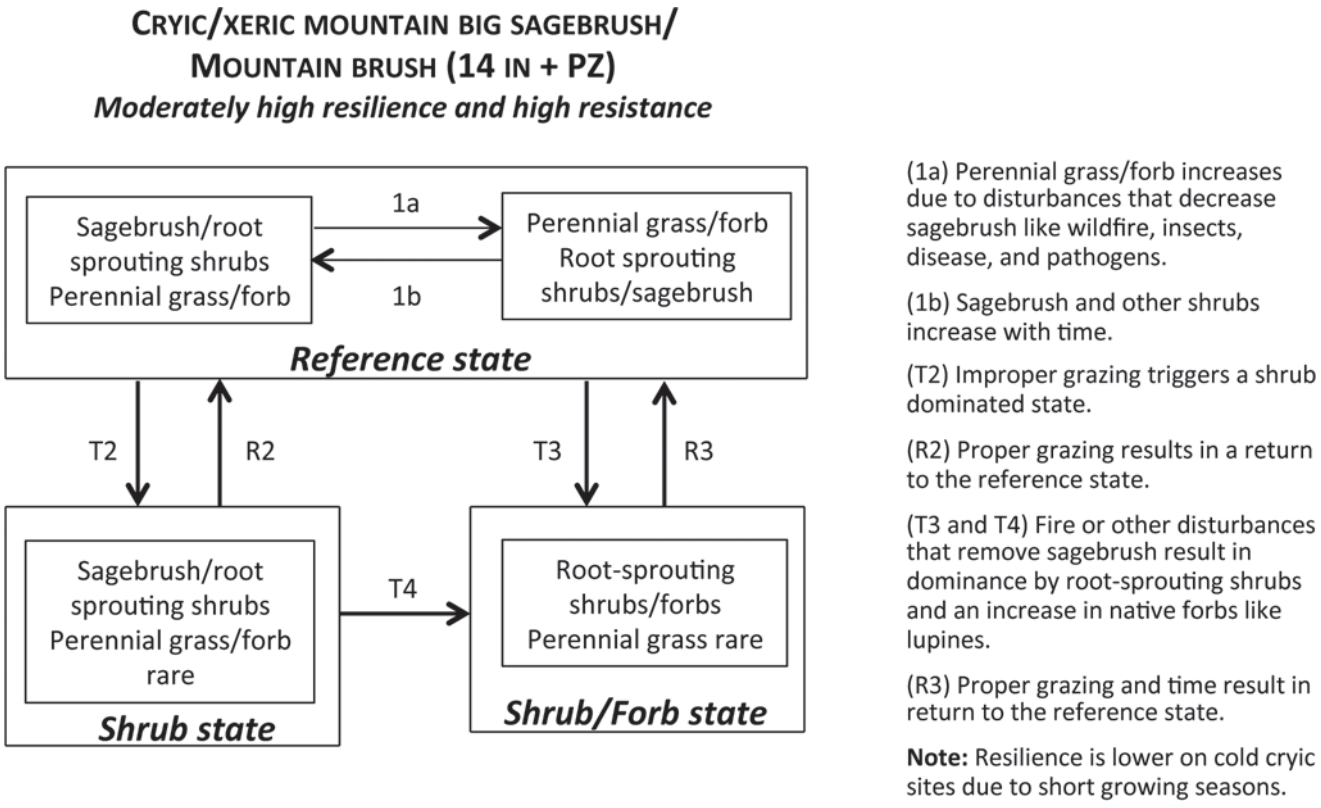
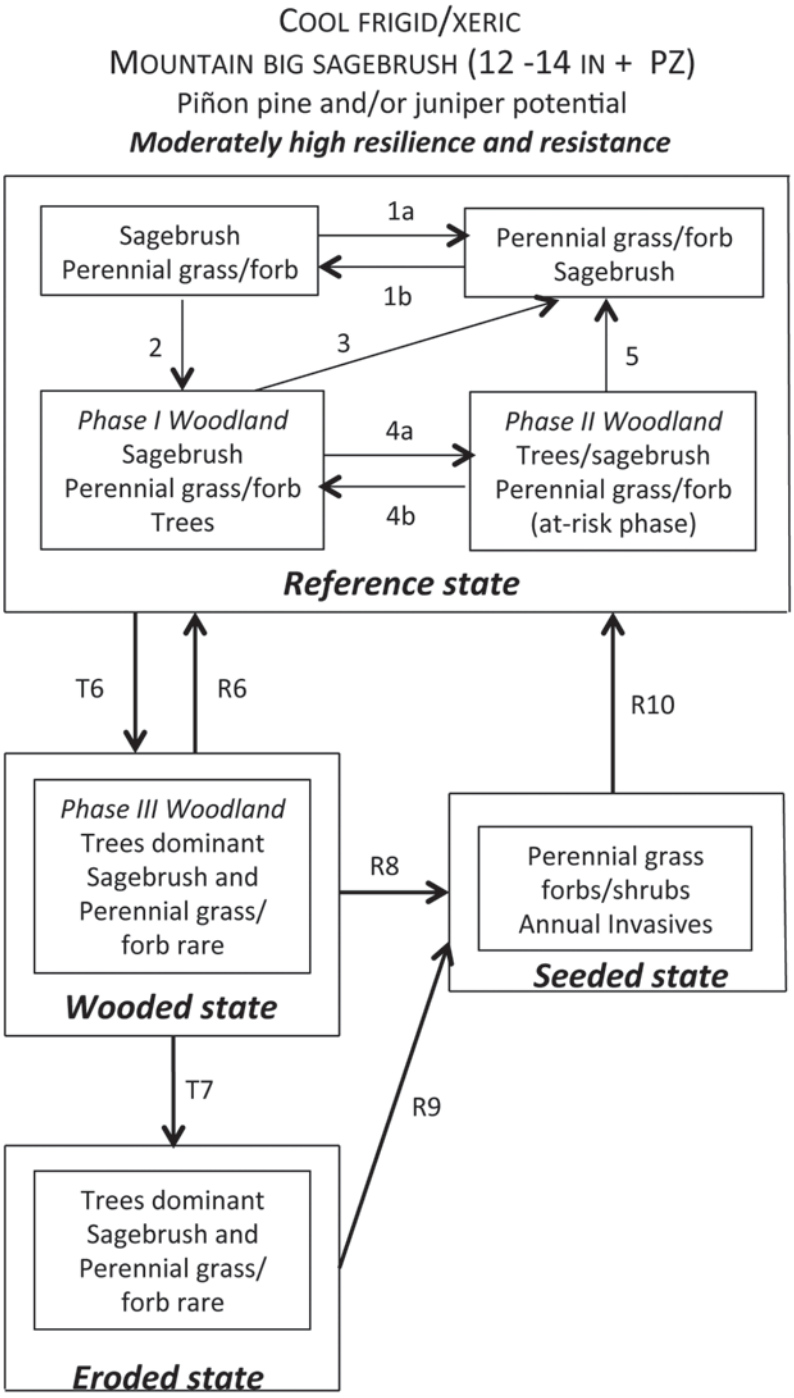


Figure A.5A. STM for a cryic/xeric mountain big sagebrush/mountain brush ecological type characterized by moderately high resilience and high resistance.



(1a) Disturbances such as wildfire, insects, disease, and pathogens result in less sagebrush and more perennial grass/forb.

(1b) Sagebrush increases with time .

(2) Time combined with seed sources for piñon and/or juniper trigger a Phase I Woodland.

(3 and 5) Fire and or fire surrogates (herbicides and/or mechanical treatments) that remove trees may restore perennial grass/forb and sagebrush dominance.

(4a) Increasing tree abundance results in a Phase II woodland with depleted perennial grass/forb and shrubs and an at-risk phase.

(4b) Fire surrogates (herbicides and/or mechanical treatments) that remove trees may restore perennial grass/forb and sagebrush dominance.

(T6) Infilling of trees and/or improper grazing can result in a biotic threshold crossing to a wooded state with increased risk of high severity crown fires .

(R6) Fire, herbicides and/or mechanical treatments that remove trees may restore perennial grass/forb and sagebrush dominance.

(T7) An irreversible abiotic threshold crossing to an eroded state can occur depending on soils, slope, and understory species.

(R8 and R9) Seeding after fire may be required on sites with depleted perennial grass/forb, but seeding with aggressive introduced species can decrease native perennial grass/forb. Annual invasives are typically rare. Seeded eroded states may have lower productivity.

(R10) Depending on seed mix and grazing, return to the reference state may be possible if an irreversible threshold has not been crossed.

Figure A.5B. STM for a cool frigid/xeric mountain big sagebrush ecological type that has piñon pine and/or juniper potential and is characterized by moderately high resilience and resistance.

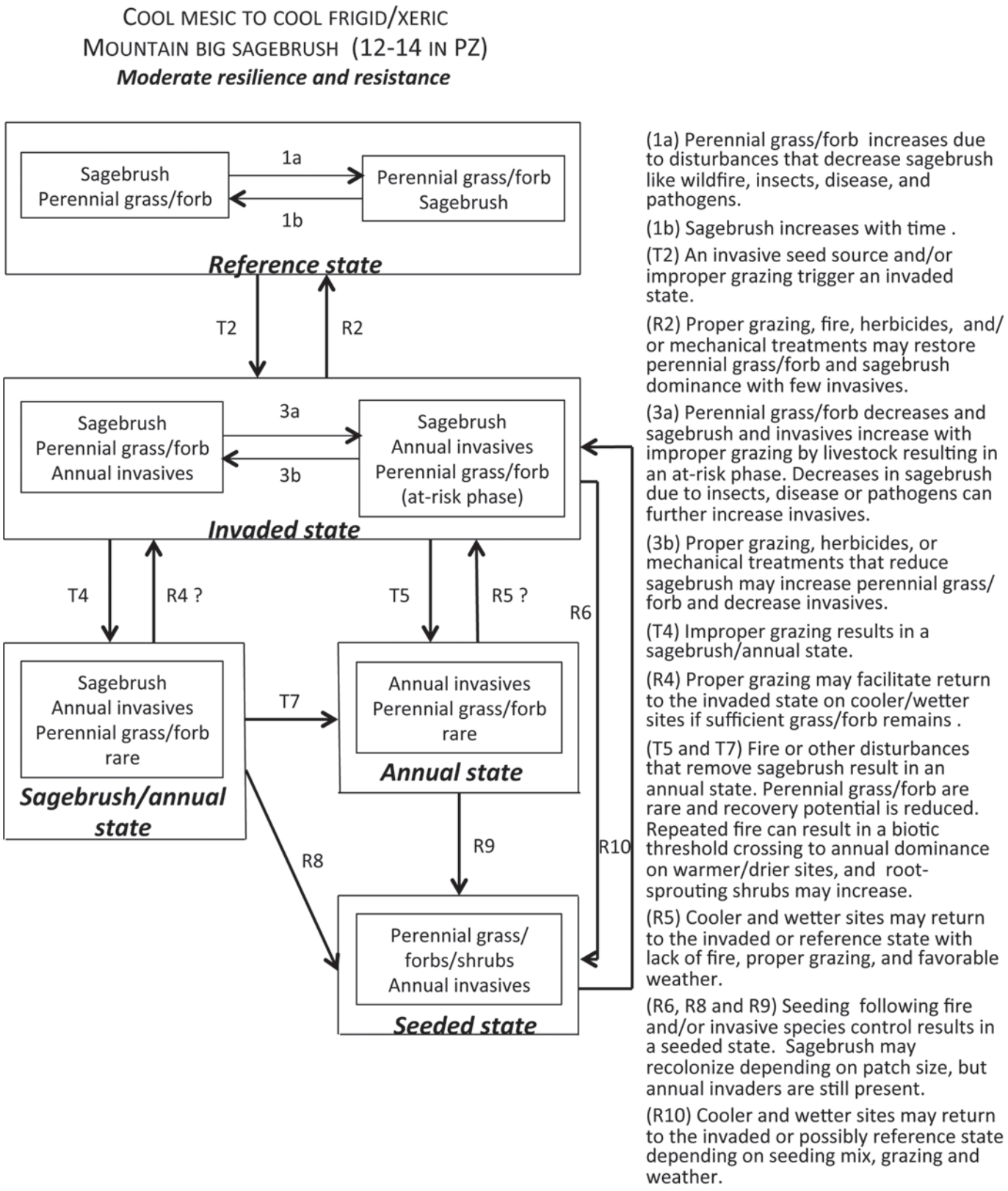


Figure A.5C. STM for a cool mesic to cool frigid/xeric mountain big sagebrush ecological type that is characterized by moderate resilience and resistance.

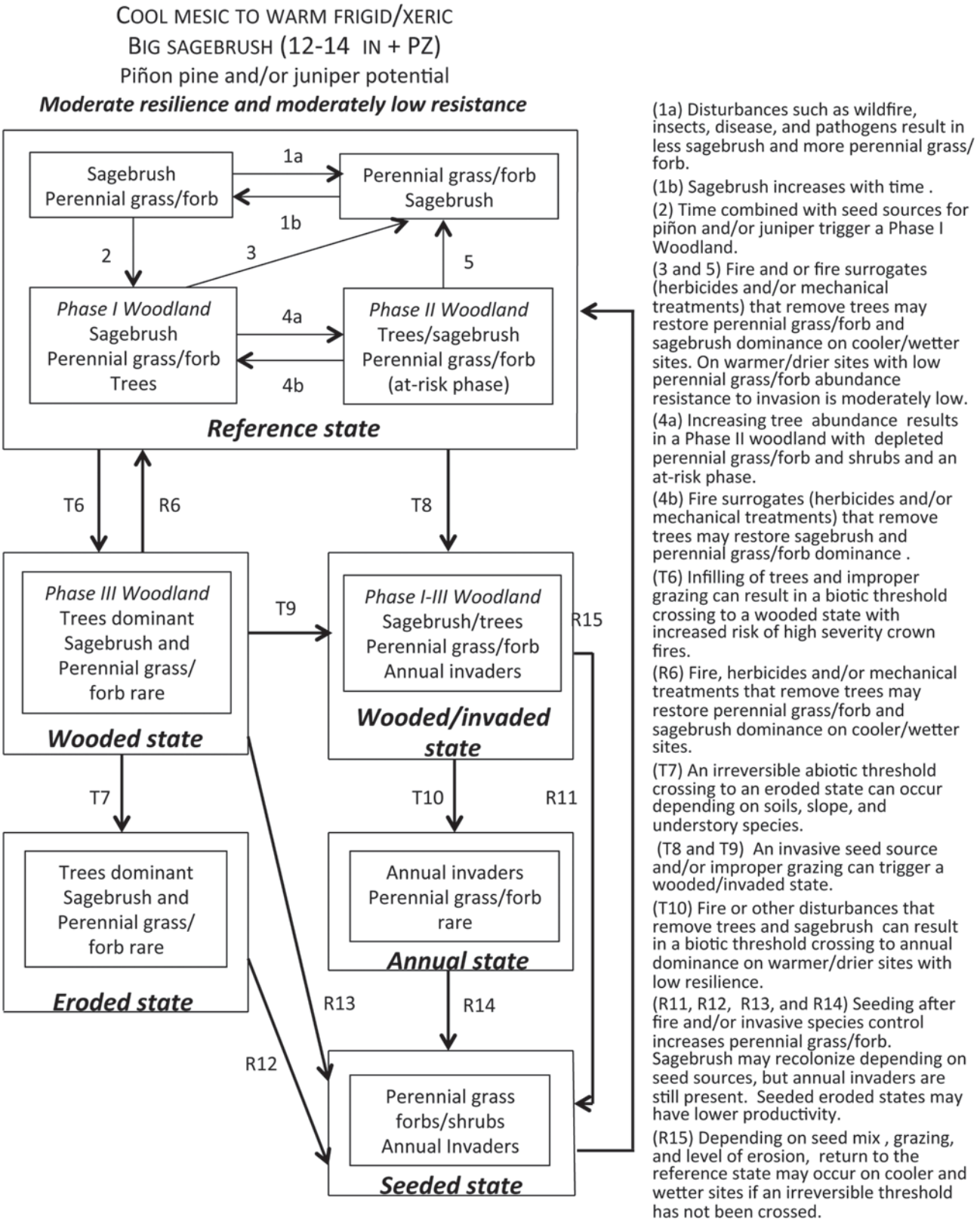


Figure A.5D. STM for a cool mesic to warm frigid/xeric mountain big sagebrush ecological type type that has piñon pine and/or juniper potential and is characterized by moderate resilience and moderately low resistance.

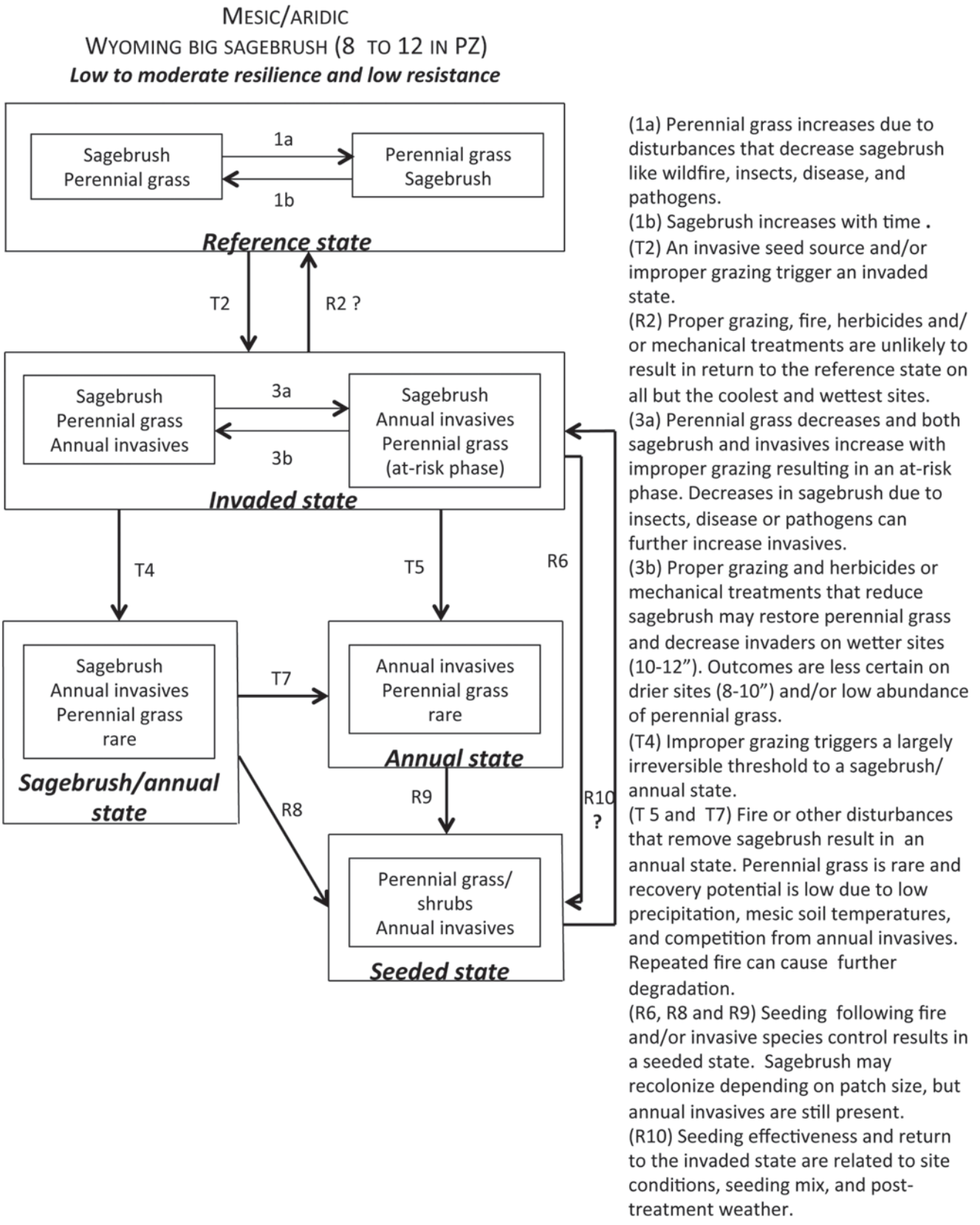


Figure A.5E. STM for a mesic/aridic Wyoming big sagebrush ecological type with low to moderate resilience and low resistance.

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Greater Sage-Grouse Wildfire, Invasive Annual Grasses & Conifer Expansion Assessment

June 2014

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Introduction and Background

The purpose of this assessment is to identify priority habitat areas and management strategies to reduce the threats to Greater Sage-Grouse resulting from impacts of invasive annual grasses, wildfires, and conifer expansion. The Conservation Objectives Team (COT) report (USFWS 2013) and other scientific publications identify wildfire and conversion of sagebrush habitat to invasive annual grass dominated vegetative communities as two of the primary threats to the sustainability of Greater Sage-Grouse (*Centrocercus urophasianus*, hereafter sage-grouse) in the western portion of the species range. For the purposes of this assessment protocol, invasive species are limited to, and hereafter referred to, as **invasive annual grasses** (e.g., primarily cheatgrass [*Bromus tectorum*]). Conifer expansion (also called encroachment) is also addressed in this assessment.

The United States Fish and Wildlife Service (USFWS) will consider the amelioration of impacts, location and extent of treatments, degree of fire risk reduction, locations for suppression priorities, and other proactive measures to conserve sage-grouse in their 2015 listing decision. This determination will be made based in part upon information contained in the United States (US) Department of the Interior, Bureau of Land Management (BLM) resource management plan (RMP) amendments and Forest Service land resource management plan (LRMP) amendments, including this assessment.

This assessment is based in part on National Resources Conservation Service (NRCS) soil surveys that include geospatial information on soil temperature and moisture regimes associated with resistance and resiliency properties (see following section on *Soil Temperature and Moisture Regimes)*. While this assessment is applicable across the range of sage-grouse, the analysis is limited to Western Association of Fish and Wildlife Management Agencies' (WAFWA) Management Zones III, IV, and V (roughly the Great Basin region) because of the significant issues associated with invasive annual grasses and the high level of wildfires in this region. The utility of this assessment process is dependent on incorporating improved information and geospatial data as it becomes available. Although the resistance and resilience concepts have broad applications (e.g., infrastructure development), this assessment is limited to developing strategies to reduce threats to sage-grouse habitat (e.g., invasive annual grasses and wildfires).

Draft Greater Sage-Grouse Environmental Impact Statements (EISs) contain a suggested framework in the appendices ("Draft Greater Sage-Grouse Wildland Fire and Invasive Species Assessment") that provided a consistent approach to conduct these assessments. The current protocol was developed by the Fire and Invasive Species Team (FIAT), a team of wildland fire specialists and other resource specialists and managers, to specifically incorporate resistance to invasive annual grasses and resilience after disturbance principles into the assessment protocol. This protocol is also referred to as the Fire and Invasive Tool. In October 2013, the BLM, Forest Service, and USFWS agreed to incorporate this approach into the final EISs.

The cornerstone of the FIAT protocol is recent scientific research on resistance and resilience of Great Basin ecosystems (Chambers et al. 2014) and the USFWS-sponsored project with the Western Association of Fish and Wildlife Agencies (WAFWA) to assemble an interdisciplinary team to provide additional information on wildland fire and invasive plants and to develop strategies for addressing

these issues. This interagency collaboration between rangeland scientists, fire specialists, and sage-grouse biologists resulted in the development of a strategic, multi-scale approach for employing ecosystem resilience and resistance concepts to manage threats to sage-grouse habitats from wildfire and invasive annual grasses (Chambers et al. 2014). This paper has been published as a Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-326 and is posted online at http://www.fs.fed.us/rm/pubs/rmrs_gtr326.pdf. It serves as the reference and basis for the protocol described in this assessment.

The assessment process sets the stage for:

- Identifying important sage-grouse occupied habitats and baseline data layers important in defining and prioritizing sage-grouse habitats
- Assessing the resistance to invasive annual grasses and resilience after disturbance and prioritizing focal habitats for conservation and restoration
- Identifying geospatially explicit management strategies to conserve sage-grouse habitats

Management strategies are types of actions or treatments that managers typically implement to resolve resource issues. They can be divided into proactive approaches (e.g., fuels management and habitat recovery/restoration) and reactive approaches (e.g., fire operations and post-fire rehabilitation). Proactive management strategies can favorably modify wildfire behavior and restore or improve desirable habitat with greater resistance to invasive annual grasses and/or resilience after disturbances such as wildfires. Reactive management strategies are employed to reduce the loss of sage-grouse habitat from wildfires or stabilize soils and reduce impacts of invasive annual grasses in sage-grouse habitat after wildfires. Proactive management strategies will result in long-term sage-grouse habitat improvement and stability, while reactive management strategies are essential to reducing current impacts of wildfires on sage-grouse habitat, thus maintaining long-term habitat stability. Management strategies include:

Proactive Strategies-

1. **Fuels Management** includes projects that are designed to change vegetation composition and/or structure to modify fire behavior characteristics for the purpose of aiding in fire suppression and reducing fire extent.

2. **Habitat Restoration/Recovery**
    a. Recovery, referred to as passive restoration (Pyke 2011), is focused on changes in land use (e.g., improved livestock grazing practices) to achieve a desired outcome where the plant community has not crossed a biotic or physical threshold.
    b. Restoration is equivalent to active restoration (Pyke 2011) and is needed when desired species or structural groups are poorly represented in the community and reseeding, often preceded by removal of undesirable species, is required. Note: The Fuels Management program supports recovery/restoration projects through its objective to restore and maintain resilient landscapes.

Reactive Strategies-

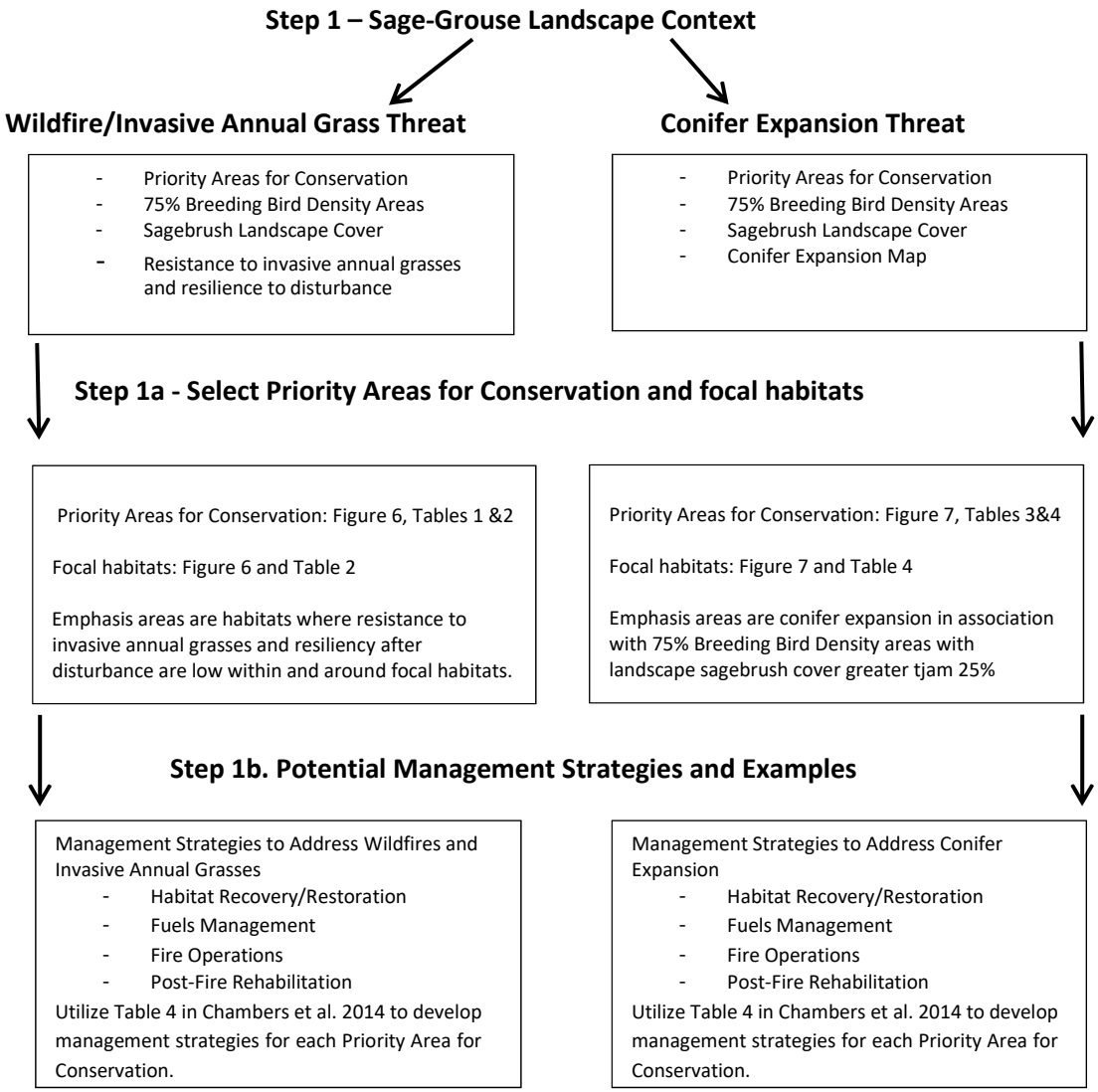
3. **Fire Operations** includes preparedness, prevention, and suppression activities. When discussing specific components of fire operations, the terms fire preparedness, fire prevention and fire suppression are used.

4. **Post-Fire Rehabilitation** includes the BLM's Emergency Stabilization and Rehabilitation (ES&R) Program and the Forest Service's Burned Area Emergency Response (BAER) Program. Policy limits application of funds from 1 to 3 years, thus treatments to restore or enhance habitat after this period of time are considered habitat recovery/restoration.

The assessment process included two steps with sub-elements. First, important Priority Areas for Conservation (PACs) and focal habitats are identified (**Step 1a**). Second, potential management **strategies** (described above) are identified to conserve or restore focal habitats threatened by wildfires, invasive annual grasses, and conifer expansion (primarily pinyon pine and/or juniper species; **Step 1b**). Focal habitats are the portions of a PAC with important habitat characteristics, bird populations, and threats (e.g., wildfires, invasive annual grasses, and conifer expansion) where this assessment will be applied. Areas adjacent to or near the focal habitats can be considered for management treatments such as fire control and fuels management if these locations can reduce wildfire impacts to focal habitats. Soil temperature and moisture regimes are used to characterize capacity for resistance to invasive annual grasses and resilience after disturbance (primarily wildfires) within focal habitats to assist in identifying appropriate management strategies, especially in areas with good habitat characteristics that have low recovery potential following disturbance. Soil moisture and temperature regime relationships have not been quantified to the same degree as for conifer expansion; however, Chambers et al. 2014) discuss preliminary correlations between these two variables.

The results of Steps 1a and 1b, along with associated geospatial data files, are available to local management units to complete Step 2 of the assessment process. Step 2 is conducted by local management units to address wildfire, invasive annual grasses, and conifer expansion in or near focal habitat areas. First, local information and geospatial data are collected and evaluated to apply and improve on Step 1 focal habitat area geospatial data (**Step 2a**). Second, focal habitat activity and implementation plans are developed and include prioritized management **tactics and treatments** to implement effective, fuels management, habitat recovery/restoration, fire operations, and post-fire rehabilitation strategies (**Step 2b**). This assessment will work best if Step 2b is done across management units (internal and externally across BLM and Forest Service administrative units and with other entities). **Figure 1**, Assessment Flow Chart, contains an illustration of the steps in the assessment process.

This analysis does not necessarily address the full suite of actions needed to maintain the current distribution and connectivity of sage-grouse habitats across the Great Basin because resources available to the federal agencies are limited at this time. Future efforts designed to maintain and connect habitats across the range will be needed as current focal areas are addressed and additional resources become available.



Step 2 – Management Unit Applications for Invasive Annual Grasses and Conifer Expansion

Step 2a

1) Evaluate the accuracy and utility of Step 1 geospatial layers and incorporate relevant local information.
2) Develop framework for incorporating management strategies to initiate implementation/activity plans.

Step 2b

Develop collaborative implementation/activity plans to address threats to focal habitats in Priority Areas for Conservation.

Figure 1, Assessment Flow Chart

Step 1

The first component of the Wildfire and Invasive Annual Grasses Assessment describes the factors that collectively provide the sage-grouse landscape context. Step 1a provides this context by discussing PACs, breeding bird density (BBD), soil temperature and moisture regimes (indicators of resistance to annual grasses and resilience after disturbance), landscape sagebrush cover, and conifer expansion. See Chambers et al. 2014) for a detailed description of Invasive Annual Grass and Wildfire threats to sage-grouse habitat. Priority PACs and focal habitats are derived from the information provided in this sage-grouse landscape context section.

Step 1a- Sage-grouse landscape context

This component of the assessment identifies important PACs and associated focal habitats where wildfire, invasive annual grasses, and conifer expansion pose the most significant threats to sage-grouse.

The primary focus of this assessment is on sage-grouse populations across the WAFWA Management Zones III, IV, and V (**Figure 2**, Current PACs for WAFWA Management Zones III, IV, and V). Sage-grouse are considered a landscape species that require very large areas to meet their annual life history needs. Sage-grouse are highly clumped in their distribution (Doherty et al. 2010), and the amount of landscape cover in sagebrush is an important predictor of sage-grouse persistence in these population centers (Knick et al. 2013). States have used this information combined with local knowledge to identify PACs to help guide long-term conservation efforts. FIAT used data sets that were available across the three management zones as an initial step for prioritizing selected PACs and identifying focal habitats for fire and invasive annual grasses and conifer expansion assessments. These data sets (also described in Chambers et al. 2014) include:

Priority Areas for Conservation (PACs)

PACs have been identified by states as key areas that are necessary to maintain redundant, representative, and resilient sage-grouse populations (USFWS 2013; see Figure 2). A primary objective is to minimize threats within PACs (e.g., wildfire and invasive annual grasses impacts) to ensure the long-term viability of sage-grouse and its habitats. A secondary priority is to conserve sage-grouse habitats outside of PACs since they may also be important for habitat connectivity between PACs (genetic and habitat linkages), habitat restoration and population expansion opportunities, and flexibility for managing habitat changes that may result from climate change. PACs have also been identified by the USFWS as one of the reporting geographic areas that will be considered during listing determinations for sage-grouse.

The combination of PACs with BBD data (described below) assists us in identifying connectivity between populations. PAC boundaries may be modified in the future requiring adjustments in focal habitat areas and management strategy priorities.

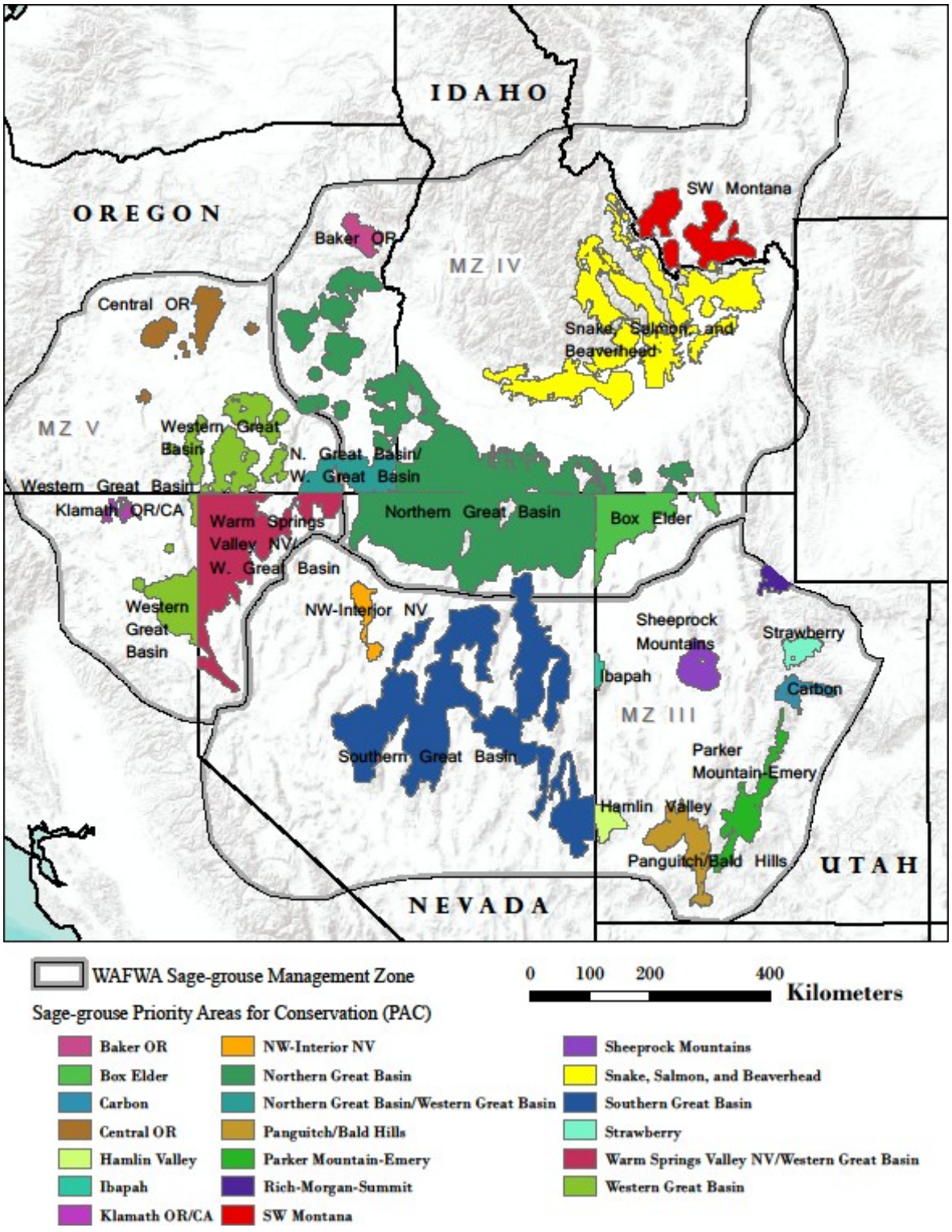


Figure 2, Current PACs for WAFWA Management Zones III, IV, and V. Bi-State sage-grouse populations were not included for this analysis and are being addressed in separate planning efforts.

Breeding Bird Density

Doherty et al. (2010) provided a useful framework for identifying population concentration centers in their range-wide BBD mapping. FIAT used maximum counts of males on leks (4,885 males) to delineate breeding bird density areas that contain 25, 50, 75, and 100 percent of the known breeding population. Leks were then mapped according to abundance values and buffered by 4 to 5.2 miles (6.4 to 8.5 kilometers) to delineate nesting areas. Findings showed that while sage-grouse occupy extremely large landscapes, their breeding distribution is highly aggregated in comparably smaller identifiable population centers; 25 percent of the known population occurs within 3.9 percent (7.2 million acres [2.92 million hectares]) of the species range, and 75 percent of birds are within 27 percent of the species range (50.5 million acres [20.4 million hectares]; Doherty et al. 2010). See **Figures 3**, Sage-Grouse Breeding Bird Density Thresholds.

This analysis places emphasis on breeding habitats because little broad/mid-scale data exists for associated brood-rearing (summer) and winter habitat use areas. Finer scale seasonal habitat use data should be incorporated (or, if not available studies, should be conducted) at local levels to ensure management actions encompass all seasonal habitat requirements. Federal administrative units should consult with state wildlife agencies for additional seasonal habitat information.

For this assessment, FIAT chose to use the 75 percent BBD as an indicator of high bird density areas that informed the approach used by state wildlife agencies to initially identify PACs. Range-wide BBD areas provide a means to further prioritize actions within relatively large PACs to maintain bird distribution and abundance. FIAT used state level BBD data from Doherty et al. (2010) instead of range-wide model results to ensure important breeding areas in Management Zones III, IV, and V were not underweighted due to relatively higher bird densities in the eastern portion of the range. BBD areas of 75 to 100 percent are included in Appendix 1 to provide context for local management units when making decisions concerning connectivity between populations and PACs.

Note that breeding density areas were identified using best available information in 2009, so this range-wide data does not reflect the most current lek count information and changes in conditions since the original analysis. Subsequent analysis should use the most current information available. Also, BBD areas should not be viewed as rigid boundaries but rather as a means to regionally prioritize landscapes where step down assessments and actions should be implemented quickly to conserve the most birds.

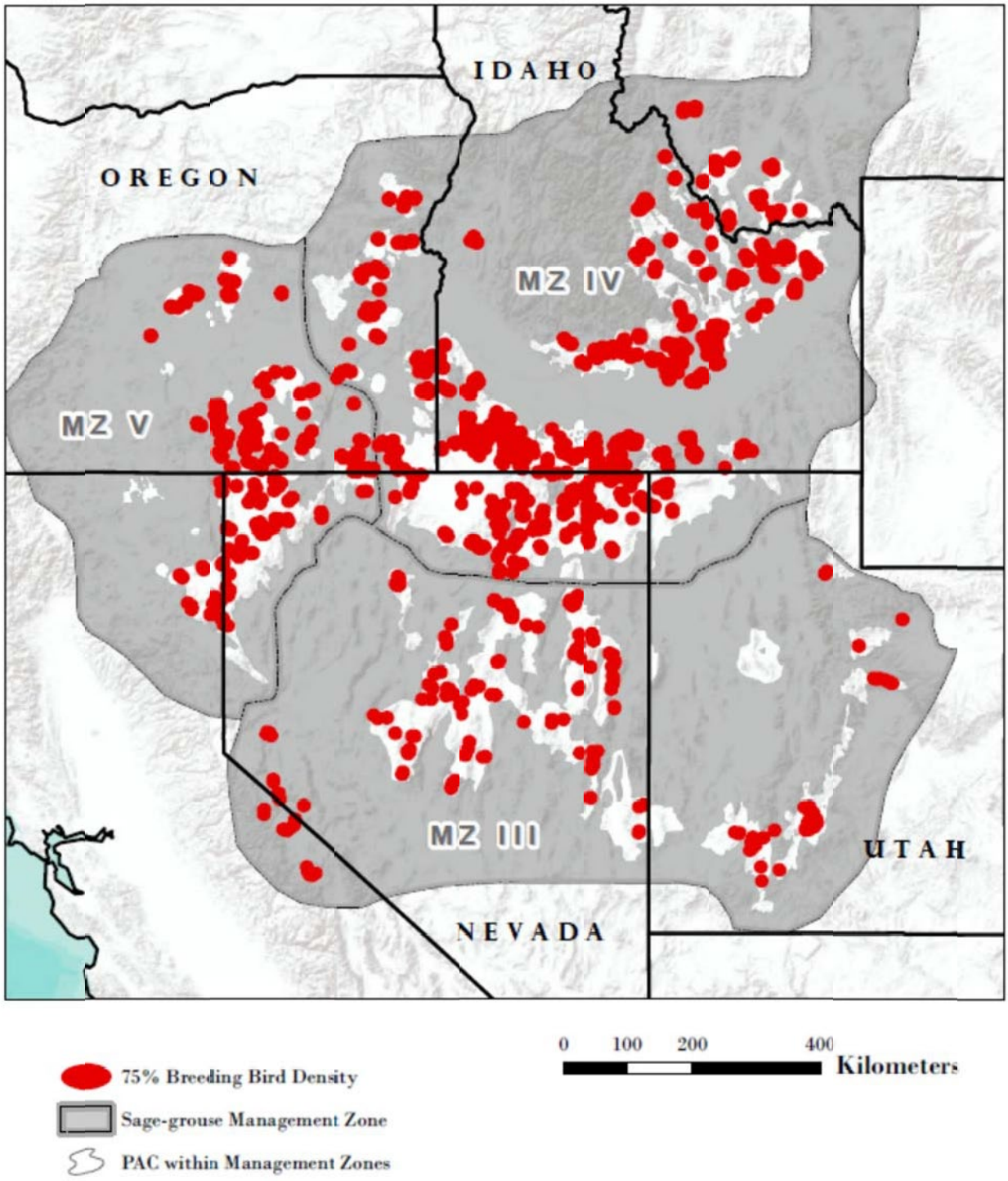


Figure 3, Sage-Grouse Breeding Bird Density Thresholds for 75% of the breeding birds, Management Zones, and PACs. Breeding bird density of 75 to 100% is shown in Appendix 1 to provide context for local management units when making decisions concerning connectivity between populations and PACs.

Soil Temperature and Moisture Regimes

Invasive annual grasses and wildfires can be tied to management strategies through an understanding of resistance and resilience concepts. Invasive annual grasses has significantly reduced sage-grouse habitat throughout large portions of its range (Miller et al. 2011). While abandoned leks were linked to increased nonnative annual grass presence, active leks were associated with less annual grassland cover than in the surrounding landscape (Knick et al. 2013). Invasive annual grasses also increases fire frequency, which directly threatens sage-grouse habitat and further promotes the establishment of invasive annual grasses (Balch et al. 2013). This nonnative annual grass and fire feedback loop can result in conversion from sagebrush shrublands to annual grasslands (Davies 2011).

In cold desert shrublands, vegetation community resistance to invasive annual grasses and resilience following disturbance is strongly influenced by soil temperature and moisture regimes (Chambers et al. 2007; Meyer et al. 2001). Generally, colder soil temperature regimes and moister soil moisture regimes are associated with more resilient and resistant vegetation communities. While vegetation productivity and ability to compete and recover from disturbance increase along a moisture gradient, cooler temperatures limit invasive annual grass growth and reproduction (Chambers et al. 2007; Chambers et al. 2014). Conversely, warm and dry soil temperature and moisture regimes and to a lesser degree cool and dry soil temperature and moisture regimes, are linked to less resistant and resilient communities (see Figure 9 in Chambers et al. 2014). A continuum in resistance and resilience exists between the warm and dry and cool and dry soil temperature and moisture regimes that will need to be considered in Step 2 in developing implementation or activity plans. These relationships can be used to prioritize management actions within sage-grouse habitat using broadly available data.

To capture relative resistance and resilience to disturbance and invasive annual grasses across the landscape, soil temperature and moisture regime information (described in greater detail in Chambers et al. 2014) were obtained from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) data. Where gaps in this coverage existed, the NRCS US General Soil Map (STATSGO2) data was used (Soil Survey Staff 2014; see Appendix 1). The STATSGO2 database includes soils mapped at a 1:250,000-scale; the SSURGO database includes soils mapped at the 1:20,000 scale. Interpretations made from soil temperature and moisture regimes from the STATSGO2 database will not have the same level of accuracy as those made from the SSURGO database.

Areas characterized by warm and dry soil temperature and moisture regimes (low relative resistance and resilience) were intersected with sage-grouse breeding habitat and sagebrush landscape cover to identify candidate areas (emphasis areas) for potential management actions that mitigate threats from invasive annual grasses and wildfire (**Figure 4**, Soil Moisture and Temperature Regimes for Management Zones III, IV, and V, and **Figure 5**, Intersection of High Density (75% BBD) Populations). These data layers provide the baseline information considered important in prioritizing areas where conservation and management actions could be developed to address invasive annual grasses in a scientifically defensible manner (see Table 4 in Chambers et al. 2014).

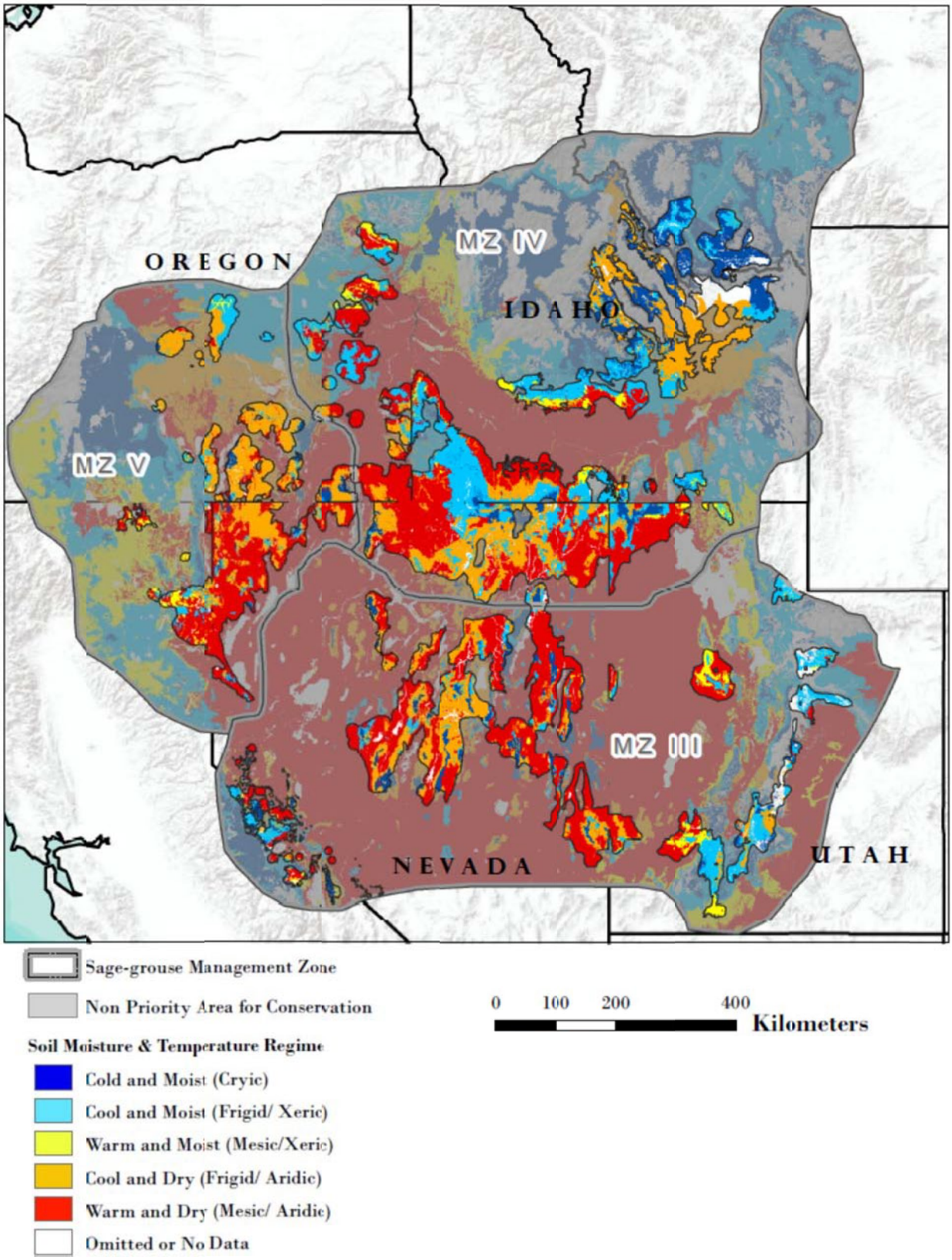


Figure 4, Soil Moistur and Temperature Regimes for Management Zones III, IV, and V

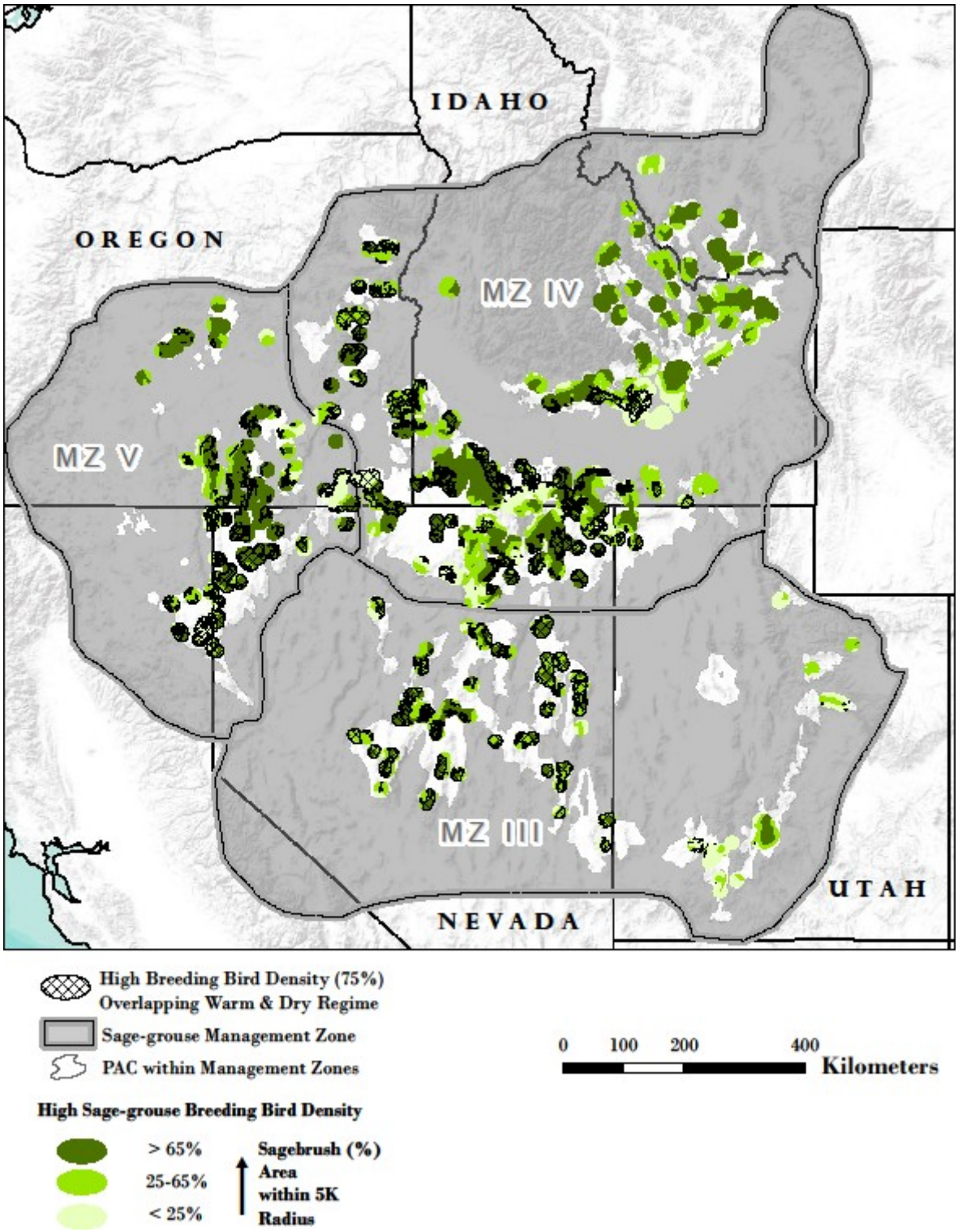


Figure 5, Intersection of High Density (75% BBD) Populations. The warm and dry sites and the proportion of these habitats in the three sagebrush landscape cover classes by management zone, and PACs within the Great Basin.

Sagebrush Landscape Cover

The amount of the landscape in sagebrush cover is closely related to the probability of maintaining active sage-grouse leks, and is used as one of the primary indicators of sage-grouse habitat potential at landscape scales (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). For purposes of prioritizing landscapes for sage-grouse habitat management, FIAT used less than or equal to 25 percent sagebrush landscape cover as a level below which there is a low probability of maintaining sage-grouse leks, and greater than or equal to 65 percent as the level above which there is a high probability of sustaining sage-grouse populations with further increases of landscape cover of sagebrush (Aldridge et al. 2008; Wisdom et al. 2011; Knick et al. 2013). Increases in landscape cover of sagebrush have a constant positive relationship with sage-grouse lek probability at between about 25 percent and 65 percent landscape sagebrush cover (Knick et al. 2013). It is important to note that these data and interpretations relate only to persistence (i.e., whether or not a lek remains active), and it is likely that higher proportions of sagebrush cover may be required for population growth.

For the purposes of delineating sagebrush habitat relative to sage-grouse requirements for landscape cover of sagebrush, FIAT calculated the percentage of landscape sagebrush cover (Landfire 2013) within a 3-mile (5-kilometer) radius of each 98-foot by 98-foot (30 meter by 30 meter) pixel in Management Zones III, IV, and V (see Appendix 2 in Chambers et al. 2014) for how landscape sagebrush cover was calculated). FIAT then grouped the percentage of landscape sagebrush cover into each of the selected categories (0 to 25 percent, 25 to 65 percent, 65 to 100 percent; **Figure 6**, Sagebrush Landscape Cover and Fire Perimeters for the Analysis Area). Landfire data was based on 2000 satellite imagery so wildfire perimeters after that date were incorporated into this layer to better reflect landscape sagebrush cover. Burned areas were assumed to fall into the 0 to 25 percent landscape cover class.

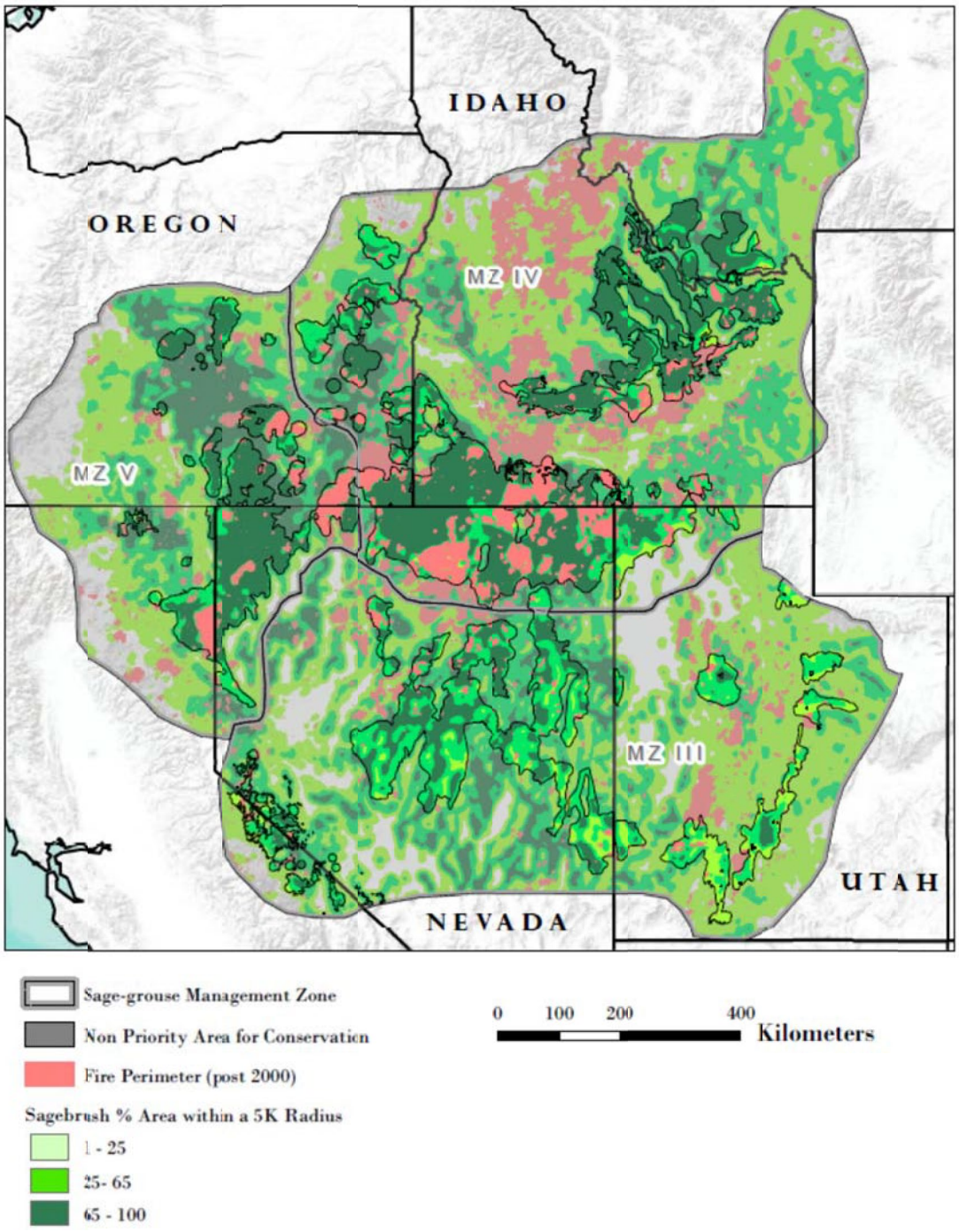


Figure 6, Sagebrush Landscape Cover and Fire Perimeters (post-2000) for the Analysis Area

Conifer Expansion

Conifer expansion into sagebrush landscapes also directly reduces sage-grouse habitat by displacing shrubs and herbaceous understory as well as by providing perches for avian predators. Conifer expansion also leads to larger, more severe fires in sagebrush systems by increasing woody fuel loads (Miller 2013). Sage-grouse populations have been shown to be impacted by even low levels of conifer expansion (Baruch-Mordo et al. 2013). Active sage-grouse leks persist in regions of relatively low conifer woodland and are threatened by conifer expansion (Baruch-Mordo et al. 2013; Knick et al. 2013).

To estimate where sage-grouse breeding habitat faces the largest threat of conifer expansion, FIAT used a risk model developed by Manier et al. (2013) that locates regions where sagebrush landscapes occur within 250 meters of conifer woodland (**Figure 7**, Modeled Conifer Expansion for PACs with Greater Than 25% Sagebrush Landscape Cover In and Around 75% BBD). Although the model is coarse, it is available for the entirety of the three sage-grouse management zones analyzed. FIAT encourages using more accurate conifer expansion data in Step 2.

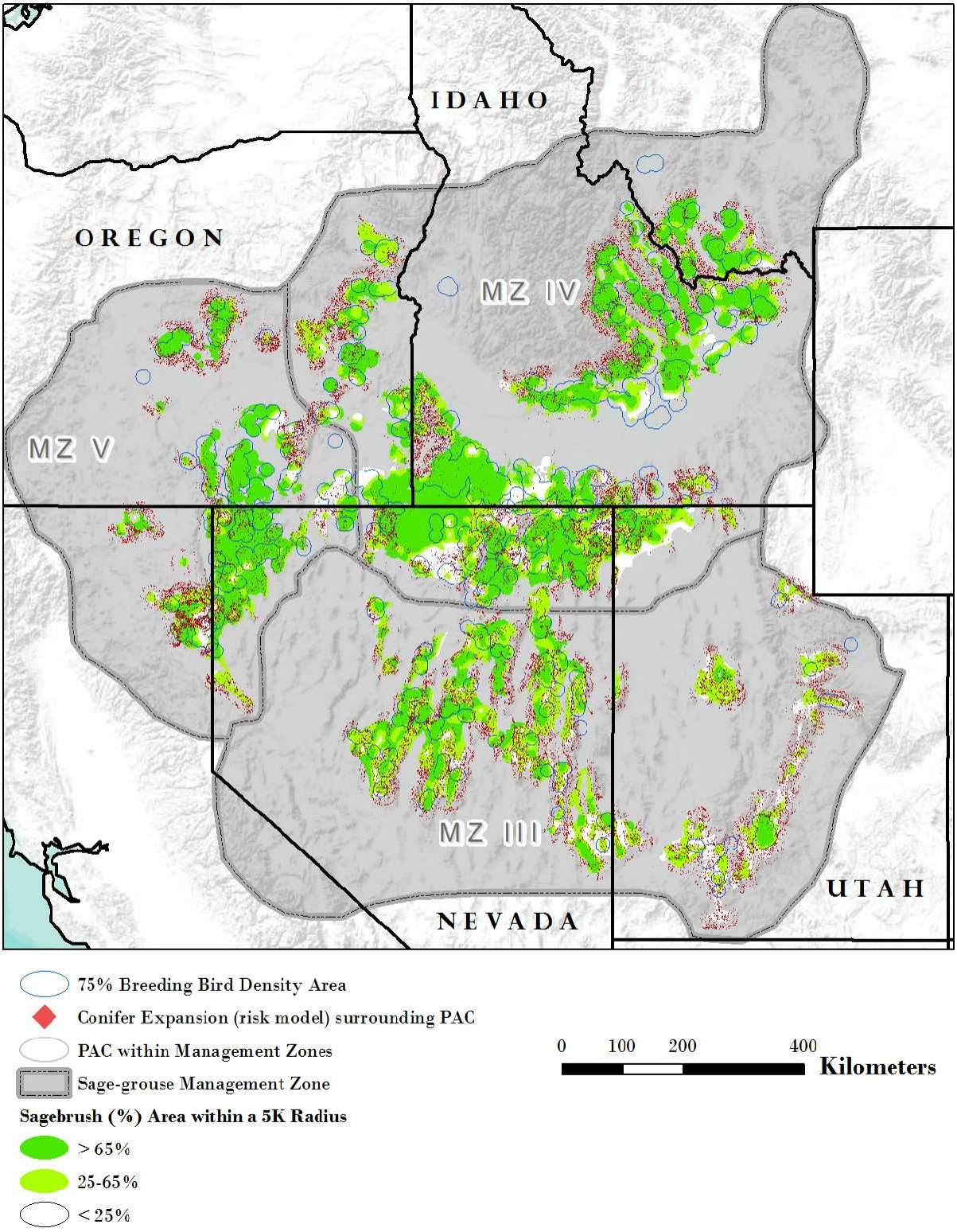


Figure 7, Modeled Conifer Expansion for PACs with Greater Than 25% Sagebrush Landscape Cover In and Around 75% BBD

Step 1a. Identifying PACs and focal habitats

A primary goal for the conservation of sage-grouse populations is the identification of important habitats needed to ensure the persistence and recovery of the species. Loss of habitat, and by inference populations, in these habitats would likely imperil the species in the Great Basin. The first objective is to protect and restore those habitats that provide assurances for retaining large well connected populations.

PACs and the 75 percent BBD maps were used to provide a first-tier stratification (e.g., focal habitats) for prioritizing areas where conservation actions could be especially important for sage-grouse populations. Although these areas are a subset of the larger sage-grouse habitats, they are readily identifiable and include habitats (e.g., breeding and nesting habitats that are considered critical for survival; Connelly et al. 2000; Holloran et al. 2005; Connelly et al. 2011) and necessary for the recovery of the species across its range.

The prioritization of habitats for conservation purposes was based on the several primary threats to remaining sage-grouse populations in the Great Basin including the loss of sagebrush habitats to wildfire and invasive annual grasses, and conifer expansion. The first, and probably the most urgent threat for sage-grouse, is the loss of sagebrush habitat due to wildfire and invasive annual species (e.g., cheatgrass; See Figure 11 in Chambers et al. 2014). Areas of highest concern are those with low resistance to cheatgrass and low resilience after disturbance (warm/dry and some cool/dry temperature and moisture regimes sites) that are either **within or in close proximity** to remaining high density populations of sage-grouse (Figure 5). Sagebrush habitats (greater than 25 percent sagebrush landscape cover) prone to conifer expansion, particularly pinyon pine and/or juniper, are also a management concern when within or adjacent to high density sage-grouse populations (Figure 7).

Because these two threats occur primarily at different points along an elevational gradient and are associated with different soil temperature and moisture regimes, separate approaches are used to select PACs and focal habitats for each.

High Density Populations at Highest Risk from <u>Wildfire and Invasive Annual Grasses</u>

PACs in Management Zones III, IV, and V. were evaluated on the basis of high density (75 percent) BBDs, sagebrush landscape cover, and soil temperature and moisture regimes to identify initial PACs that are a priority for assessments and associated focal habitats. **Figure 8**, High Priority PACs with High Density Sage-Grouse Populations (75% BBD), displays the results of the analysis focusing on the intersection of high density (75 percent BBD) populations, the warm and dry sites, and the proportion of these habitats in the three sagebrush landscape cover classes by management zone, and PACs within the Great Basin. **Table 1**, Relative Ranking of PACs Based on High Density (75% BBD) Populations, Warm/ Dry Sites, and Percentage of Habitat in Sagebrush Landscape Cover Classes, displays quantitative outputs of this analysis. The table allows a comparison of these data, and assists in selecting five PACs that provide the greatest contribution to high density sage-grouse populations, and the amounts (acres and proportion) within those PACs of sagebrush cover classes associated with warm and dry soil temperature and moisture regimes.

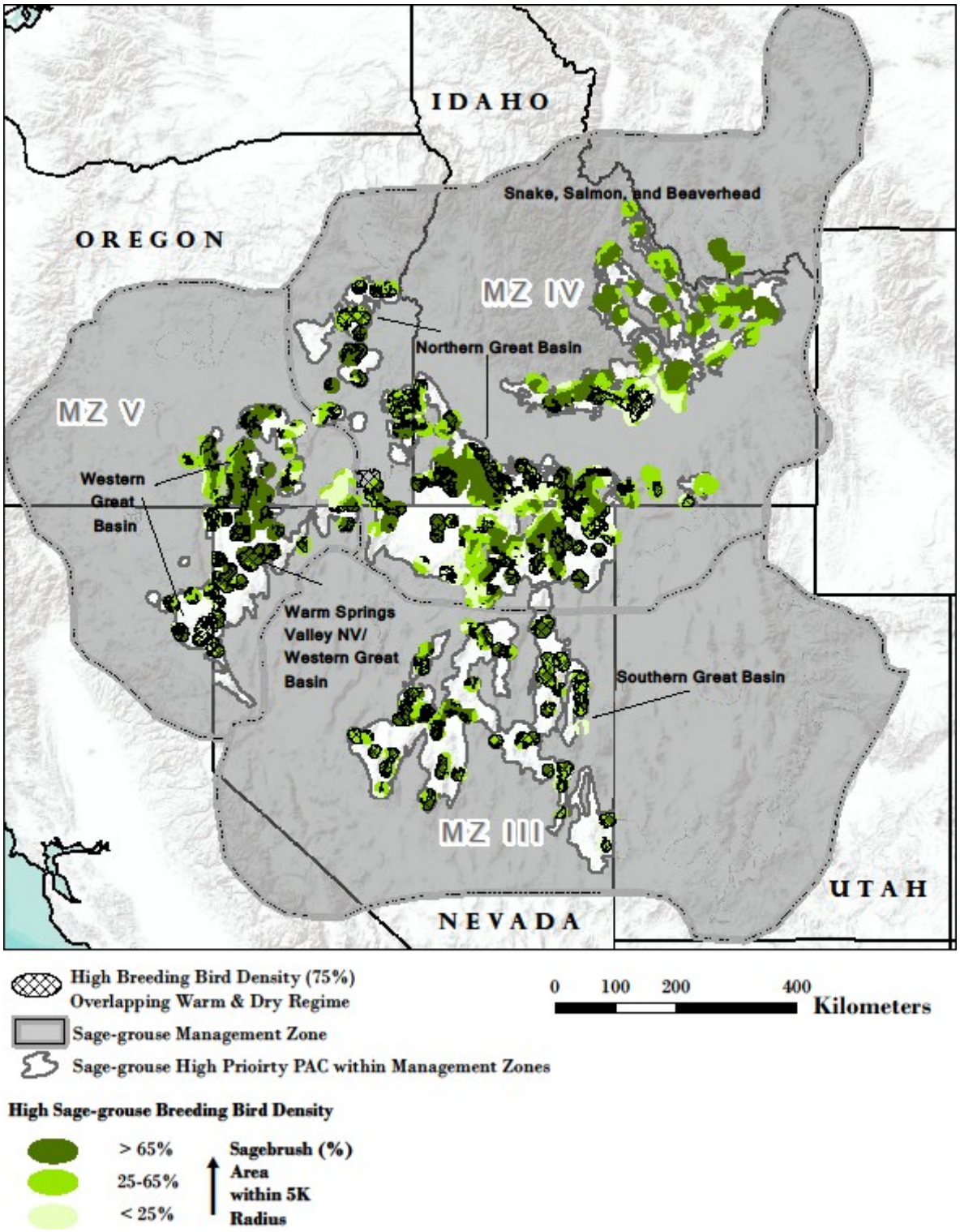


Figure 8, High Priority PACs with High Density Sage-Grouse Populations (75% BBD) sagebrush landscape cover classes, and areas with low resistance and resilience relative to wildfires and invasive annual species.

Table 1, Relative Ranking of PACs Based on High Density (75% BBD) Populations, Warm/ Dry Sites, and Percentage of Habitat in Sagebrush Landscape Cover Classes

Sage-grouse Management Zone	Sage-grouse Priority Area for Conservation (PAC) Name	Total PAC Acres	Breeding Bird Density (75%) Acres	Percent of Breeding Bird Density (75%) Area within PAC	Warm and Dry Soil Moisture & Temperature Regime within Breeding Bird Density (75%) Acres*		
					0-25% Sagebrush Landscape Cover	25%-65% Sagebrush Landscape Cover	65%+ Sagebrush Landscape Cover
4	Northern Great Basin	13045515	7383442	57%	179551 (2%)	674554 (9%)	1745163 (24%)
3	Southern Great Basin	9461355	3146056	33%	42596 (1%)	792780 (25%)	1062091 (34%)
4	Snake, Salmon, and Beaverhead	5477014	2823205	52%	68107 (2%)	89146 (3%)	95970 (3%)
5	Western Great Basin	3177253	2084626	66%	149399 (7%)	140141 (7%)	202767 (10%)
5	Warm Springs Valley NV/Western Great Basin	3520937	1558166	44%	31458 (2%)	207365 (13%)	741353 (48%)
4	SW Montana	1369076	659475	48%	0 (0%)	0 (0%)	0 (0%)
4	Northern Great Basin/Western Great Basin	1065124	624581	59%	114222 (18%)	85258 (14%)	116513 (19%)
5	Central OR	813699	451755	56%	0 (0%)	6211 (1%)	16463 (4%)
3	Panguitch/Bald Hills	1135785	352258	31%	6883 (2%)	5821 (2%)	0 (0%)
3	Parker Mountain-Emery	1122491	308845	28%	0 (0%)	127 (0%)	0 (0%)
4	Box Elder	1519454	292658	19%	22 (0%)	43325 (15%)	23913 (8%)
4	Baker OR	336540	184813	55%	0 (0%)	46459 (25%)	36214 (20%)
3	NW-Interior NV	371557	108256	29%	576 (1%)	17117 (16%)	25173 (23%)
3	Carbon	355723	97734	27%	255 (0%)	180 (0%)	0 (0%)
3	Strawberry	323219	52635	16%	0 (0%)	0 (0%)	0 (0%)
3	Rich-Morgan-Summit	217033	37005	17%	0 (0%)	0 (0%)	0 (0%)
3	Hamlin Valley	341270	3244	1%	0 (0%)	139 (4%)	3105 (96%)
3	Ibapah	98574	0	0%	0 (NA)	0 (NA)	0 (NA)
3	Sheeprock Mountains	611374	0	0%	0 (NA)	0 (NA)	0 (NA)
5	Klamath OR/CA	162667	0	0%	0 (NA)	0 (NA)	0 (NA)

* Numbers in parenthesis indicate the percent of acres relative to total acres of breeding bird density (75%)

These five PACs comprise 90 percent and 95 percent of remaining PAC sagebrush landscape cover in the 25 to 65 percent and greater than or equal to 65 percent sagebrush landscape cover classes, respectively, of the 75 percent BBD associated with low resistance/resilience habitats. The 75 percent BBD habitats in the Northern, Southern Great Basin, and Warm Spring PACs appear particularly important for two reasons. They represent a significant part of the remaining habitats for the Great Basin metapopulation, and they have the greatest amount of low resiliency habitat remaining that still functions as sage-grouse habitat.

An examination of the 5 selected PACs shows that the sum of the 75 percent BBD within these PACs is 16,995,496 acres (**Table 2**, PACs with the Highest Acres and Proportions of 75% BBD acres, and Acres and Proportions of 75% BBD Acres within the Warm/Dry Soil Temperature and Moisture Class). These are the **focal habitats**. These five PACs constitute 84 percent of the 75 percent BBD low resiliency habitats for all Management Zones III, IV, and V PACs. Within and immediately around these focal habitats, 5,751,293 acres are in high BBD areas with landscape sagebrush cover in the 25-65 percent and ≥ 65 percent classes and in the warm and dry soil temperature and moisture regimes. These are the habitats in the most danger to loss due to their low resistance to invasive annual grasses and low resilience following wildfire. Within the focal habitats in the high priority PACs, low resistance and resilience areas (cross-hatched areas in Figure 8) are a high priority (emphasis area) for implementing management strategies. Applying management strategies outside the emphasis areas are appropriate if the application of fire operations and fuels management activities will be more effective in addressing wildfire threats.

Table 2, PACs with the Highest Acres and Proportions of 75% BBD acres, and Acres and Proportions of 75% BBD Acres within the Warm/Dry Soil Temperature and Moisture Class (see Figure 8)

PAC	PAC Acres	Acres of 75% BBD in PAC (**focal habitat**)	Proportion of 75% BBD within PACs	Warm & Dry Soils within 75% BBD by Sagebrush Landscape Cover Classes Greater Than 25%*	
				25-65%	>65%
Northern Great Basin	13,045,515	7,383,442	0.57	674,517(9%)	1,745,163(24%)
Southern Great Basin	9,461,355	3,146,056	0.33	792,780(25%)	1,062,091(34%)
Snake, Salmon, and Beaverhead	5,477,014	2,823,205	0.52	89,146(3%)	95,970(3%)
Warm Springs Valley NV/Western Great Basin	3,520,937	1,558,166	0.44	207,365(13%)	741,353(48%)
Western Great Basin	3,177,253	2,084,626	0.66	140,141(7%)	202,767(10%)
Total for 5 PACS	**34,682,074**	**16,995,496**	**0.49**	**1,903,949**	**3,847,344**

***** This category represents the emphasis areas for applying appropriate management strategies in or near the focal habitats due to the lower probability of recovery after disturbance and higher probability of invasive annual grasses and existing wildfire threats.

High Density Sage-Grouse Habitats at Risk from Conifer Expansion

PACs, sagebrush landscape cover, and the 75 percent BBD data were also used in conjunction with the conifer expansion data (Mainer et al. 2013) to provide an initial stratification to determine PACs where conifer removal would benefit important sagebrush habitats. Conifer expansion threats are primarily western juniper in the northern Great Basin and pinyon pine/Utah juniper in the southern Great Basin.

Figure 7 displays results of the analysis focusing on the intersection of the 75 percent BBD, and modeled conifer expansion areas within two sagebrush landscape cover classes by management zone and PACs within the Great Basin. To identify high density sage-grouse areas affected by conifer expansion, the amount and proportion of acres estimated to be affected were calculated by sagebrush cover class to assist in the identification of the focal habitats (**Table 3)**. **Table 4**, displays quantitative outputs of this analysis using the 25 to 65 percent and greater than 65 percent landscape sagebrush cover classes for the PACs. Thus, **focal habitats** for addressing conifer expansion are the areas within and near conifer expansion in sagebrush landscape cover classes of 25 to 65 percent and greater than 65 percent. Conifer expansion in these two sagebrush landscape cover classes in the 75 percent BBD areas constitutes an emphasis area for treatments to address conifer expansion. Landscapes with less than 25 percent sagebrush cover may require significant additional management actions to restore sagebrush on those landscapes and therefore were considered a lower priority for this analysis. Focal habitats are identified in Table 4 and displayed in **Figure 9**.

Table 3 assists in identifying those PACs that provide the greatest contribution to high density sage-grouse populations, and the amounts (acres and proportion) within those PACs of sagebrush cover classes associated with modelled conifer expansion areas. Although there are uncertainties associated with the model, the results help managers identify specific geographic areas where treatments in conifer (pinyon and/or juniper) could benefit existing important sage-grouse populations.

The results of the screening revealed 5 PACs that contribute substantially to the 75 percent BBD habitats and are currently impacted most by conifer expansion (primarily pinyon pine and/or juniper; Table 4 and Figure 9). Four of the five PACs identified as high priority for conifer expansion treatments were also high priorities for wildfires and invasive annual grass threats. This is likely due to the size of the PACs and the relative importance of these PACs for maintaining the Great Basin sage-grouse meta-populations. As expected, the locations of high density sage-grouse habitats affected by conifer expansion differ spatially from those associated with low resilience habitats within and among the PACs, primarily due to differences in the biophysical settings (e.g., elevation and rainfall) that contribute to threats from invasive annual grasses and wildfires.

Three PACs (Snake/Salmon/Beaverhead, Southwest Montana, and Northern Great Basin/Western Great Basin) ranked high due to their relatively large proportion of high density breeding habitats (Table 3), but were not selected since the threat of conifer expansion was relatively low. One PAC, (Snake/Salmon/Beaverhead, was identified as a potential high priority area but was dismissed because results of the conifer expansion model likely overestimated impacts due to the adjacent conifer forests in this region. The COT Report also identified conifers as a “threat present but localized” in these areas, whereas, the top five PACs prioritized all have conifers identified as a widespread priority threat to address (USFWS 2013).

Table 3, Relative Ranking of PACs Based on High Density (75% BBD) Populations, Modeled Conifer Expansion, and Percentage of Habitats in Sagebrush Landscape Cover Classes

Sage-grouse Management Zone	Sage-grouse Priority Area for Conservation (PAC) Name	PAC acres	Breeding Bird Density (75%) Acres	Relative Proportion of Breeding Bird Density Area within PAC	Conifer Expansion (Modeled) Acres*		
					0-25% Sagebrush Landscape Cover	25%-65% Sagebrush Landscape Cover	65%+ Sagebrush Landscape Cover
4	Northern Great Basin	13045515	7383442	0.57	188502 (1%)	512949 (4%)	442480 (3%)
3	Southern Great Basin	9461355	3146056	0.33	108657 (1%)	738624 (8%)	237828 (3%)
4	Snake, Salmon, and Beaverhead	5477014	2823205	0.52	4209 (0%)	92173 (2%)	216803 (4%)
5	Western Great Basin	3177253	2084626	0.66	87963 (3%)	184613 (6%)	126177 (4%)
5	Warm Springs Valley NV/Western Great I	3520937	1558166	0.44	37148 (1%)	107025 (3%)	217101 (6%)
4	SW Montana	1369076	659475	0.48	1428 (0%)	34765 (3%)	39215 (3%)
4	Northern Great Basin/Western Great Bas	1065124	624581	0.59	12101 (1%)	2247 (0%)	6161 (1%)
5	Central OR	813699	451755	0.56	3191 (0%)	44937 (6%)	59624 (7%)
3	Panguitch/Bald Hills	1135785	352258	0.31	89141 (8%)	75157 (7%)	2563 (0%)
3	Parker Mountain-Emery	1122491	308845	0.28	84719 (8%)	83441 (7%)	7469 (1%)
4	Box Elder	1519454	292658	0.19	8531 (1%)	114375 (8%)	57645 (4%)
4	Baker OR	336540	184813	0.55	945 (0%)	15263 (5%)	195 (0%)
3	NW-Interior NV	371557	108256	0.29	7929 (2%)	29440 (8%)	11813 (3%)
3	Carbon	355723	97734	0.27	15968 (4%)	34446 (10%)	283 (0%)
3	Strawberry	323219	52635	0.16	7916 (2%)	27340 (8%)	1075 (0%)
3	Rich-Morgan-Summit	217033	37005	0.17	11685 (5%)	14280 (7%)	238 (0%)
3	Hamlin Valley	341270	3244	0.01	11321 (3%)	29960 (9%)	6243 (2%)
3	Ibapah	98574	0	0.00	195 (0%)	6770 (7%)	1039 (1%)
5	Klamath OR/CA	162667	0	0.00	1 (0%)	1533 (1%)	15302 (9%)
3	Sheeprock Mountains	611374	0	0.00	16744 (3%)	78580 (13%)	11878 (2%)

* Numbers in parenthesis indicate the proportion of acres relative to total PAC acres

Table 4, PACS with the Highest Acres and Proportions of 75% BBD acres and Estimated Conifer Expansion within Sagebrush Landscape Cover Classes (25-65 percent and ≥65 percent; see Figure 9)

PAC	PAC Acres	Acres 75% BBD in PAC	Prop. 75% BBD within PACs	Conifer Expansion by Landscape Sagebrush Cover Classes 25-65% and ≥65%* Focal Habitat	
				25-65%	≥65%
Northern Great Basin	13,045,515	7,383,442	0.57	512,949 (4%)	442,480 (3%)
Southern Great Basin	9,461,355	3,146,056	0.33	738,624 (8%)	237,828 (3%)
Warm Springs Valley NV/Western Great Basin	3,520,937	1,558,166	0.44	107,025 (3%)	217,101 (6%)
Western Great Basin	3,177,253	2,084,626	0.66	184,618 (6%)	126,177 (4%)
Central Oregon	813,699	451,755	0.56	44,937 (6%)	59,624 (7%)
Total for 5 PACS	**30,018,759**	**14,624,045**	**0.49**	**1,588,153 (5%)**	**1,083,210 (4%)**

*Numbers in parenthesis represent the percent of total PAC acres for each class.

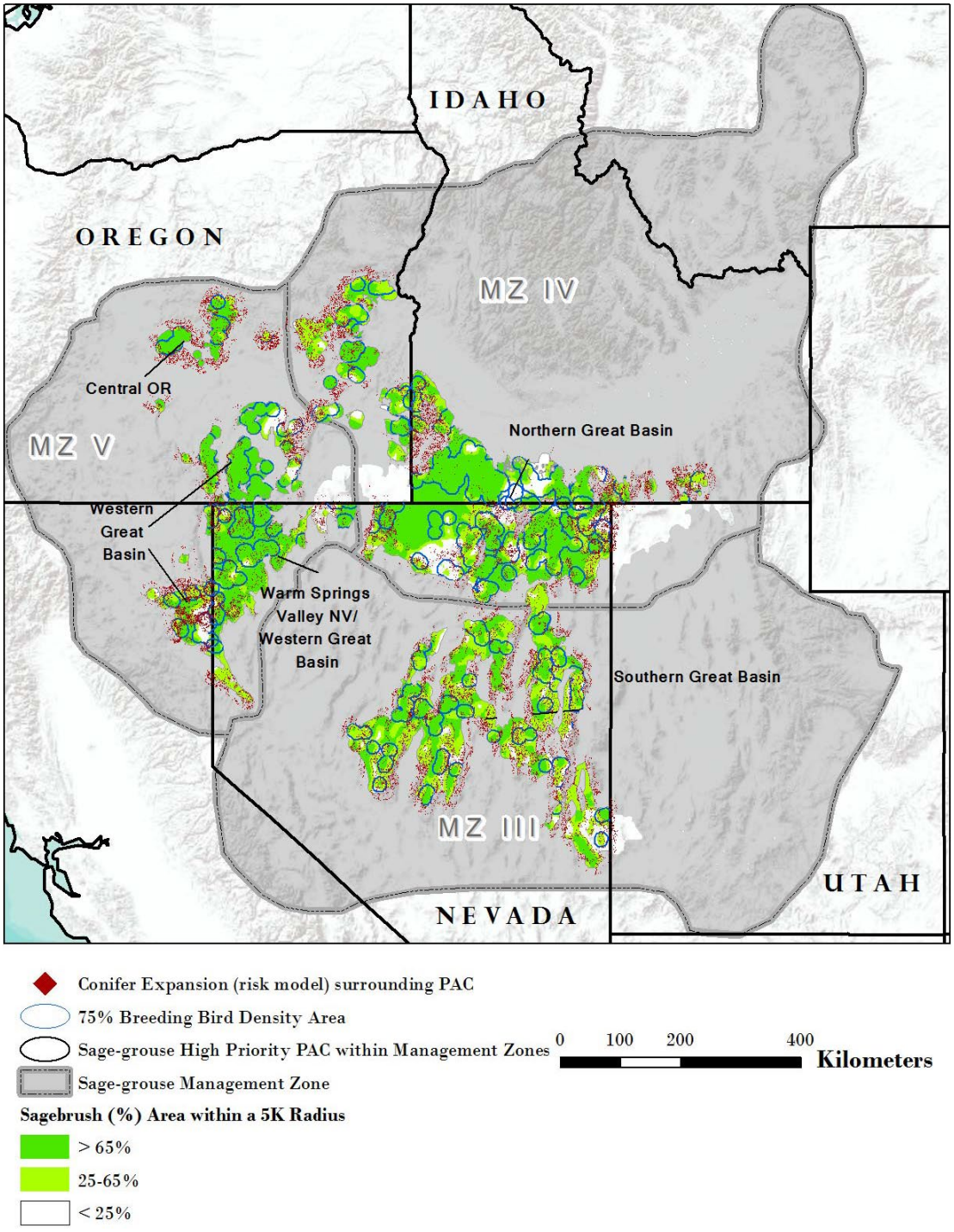


Figure 9, Five PACs Significantly Impacted by Conifer Expansion that contribute substantially to the 75% BBD and that have sagebrush landscape cover greater than 25%.

While the coarse-scale conifer expansion data used in this analysis likely over estimates the extent of the pinyon pine and/or juniper threat, results suggest that far fewer acres are currently affected by conifers than might be at risk from fire and invasive annual grasses impacts. Conifer expansion into sage-grouse habitats occurs at a slower rate, allowing more time for treatment, but early action may be needed to prevent population level impacts on sage-grouse (Baruch-Mordo et al. 2013). Furthermore, conifer expansion is primarily occurring on cooler and moister sites that are more resilient and where restoration is more likely to be effective (Miller et al. 2011), providing managers the opportunity to potentially offset at least some habitat loss expected to continue in less resilient ecosystems. While the available data set used to estimate conifer expansion provides only a coarse assessment of the problem, considerable efforts are currently underway to map conifers across sage-grouse range. These maps are expected to be available in the near future and should be used by land managers to better target project level conifer removal.

FIAT cautions against using the plotted locations of estimated conifer expansion for local management decisions due to the coarse-scale nature of this range-wide data set. Conifer expansion estimates are primarily provided here to aid in judging the relative scope of the threat in each PAC.

Step 1b. Potential Management Strategies

Potential management **strategies** (e.g., fuels management, habitat recovery/restoration, fire operations, post-fire rehabilitation) to conserve or restore Step 1 focal habitats are described below to assist local management units to initiate Step 2. These examples are illustrative and do not contain the full range of management strategies that may be required to address wildfires, invasive annual grasses, and conifer expansion within PACs and associated focal habitats. In general, the priority for applying management strategies is to first maintain or conserve intact habitat and second to strategically restore habitat (after a wildfire or proactively to reconnect habitat). Management strategies will differ when applying the protocol to:

Wildfire and Invasive Annual Grass. (See PACs identified in Table 2 and focal habitats shown in Figure 8). Focal habitats, as they relate to wildfires and invasive annual grasses, are defined as sage-grouse habitat in priority PACs within 75 percent BBD. Within these focal habitats, sagebrush communities with low resilience to disturbance and resistance to invasive annual grasses (warm and dry soil temperature and moisture regimes) are an emphasis area for management actions. Appendix 5 (A) in Chambers et al. 2014) includes a generalized state and transition model with an invasive annual grass component and warm and dry soil temperature and moisture regime associated with 8 to 12 inches of annual precipitation. This state and transition models is useful in developing management strategies to deal with annual grass issues as it contains useful restoration pathways.

Burn Probability is another tool that can be used to assist managers to identify the relative likelihood of large fire occurrence across the landscape within PACs and focal habitats. Burn probability raster data were generated by the Missoula Fire Lab using the large fire simulator - FSim - developed for use in the national Interagency **Fire Program Analysis (FPA)** project. FSim uses historical weather data and LANDFIRE fuel model data to simulate fires burning. Using these simulated fires, an overall burn probability is returned by FSim for each 270m pixel. The burn probability data was overlaid spatially with PACs, soil data, and shrub cover data. The majority of the high and very high burn probability acres lie within the top 5 PACs and are within areas with >25% sagebrush cover. Several of the other PACs have a greater overall percentage of the warm/dry soil regime with high/very high burn probability (northern great basin, baker, and NW interior NV) but the total acres are relatively few. Areas identified with high and very high burn probability are most likely to experience large fires given fire history, fuels, weather and topography. Results are displayed in the table 5 and Figure 10.

Table 5, Percentages of sage-grouse PAC areas with high and very high burn probability, 75% BBD within PAC, 75% BBD and warm dry/temperature regime, and 75% BBD and warm dry/temperature and warm dry/temperature with high and very high burn probability.

Sage Grouse Mangement Zone	*Sage-grouse Priority Area for Conservation (PAC) Name*	*Total PAC Acres*	*High, very high burn probability (percent of PAC acres)*	*75% BBD within PAC (percent PAC acres)*	*75% BBD and warm and dry soil/temperature regime ~~acres~~ (percent PAC acres)*	*75% BBD and warm and dry soil/temperature regime with high, very high burn probability (percent PAC acres)*
4	*Northern Great basin*	*13,045,415*	*86%*	*57%*	*19%*	*17%*
3	*Southern Great Basin*	*9,461,355*	*48%*	*33%*	*20%*	*9%*
4	*Snake, Salmon, and Beaverhead*	*5,477,014*	*68%*	*52%*	*5%*	*4%*
5	*Western Great Basin*	*3,177,253*	*61%*	*66%*	*15%*	*12%*
5	*Warm Springs Valley /Western Great Basin*	*3,520,937*	*30%*	*44%*	*28%*	*9%*
4	*SW Montana*	*1,369,076*	*1%*	*48%*	*0%*	*0%*
4	*Northern Great Basin/Western Great Basin*	*1,065,124*	*82%*	*59%*	*30%*	*22%*
5	*Central Oregon*	*813,699*	*71%*	*56%*	*3%*	*2%*
3	*Panguitch/Bald Hills*	*1,135,785*	*70%*	*31%*	*1%*	*1%*
3	*Parker Mountain-Emery*	*1,122,491*	*28%*	*28%*	*0%*	*0%*
4	*Box Elder*	*1,519,454*	*61%*	*19%*	*4%*	*2%*
4	*Baker Oregon*	*336,540*	*74%*	*55%*	*25%*	*21%*
3	*NW-Interior NV*	*371,557*	*99%*	*29%*	*12%*	*11%*
3	*Carbon*	*355,723*	*22%*	*27%*	*0%*	*0%*
3	*Strawberry*	*323,219*	*26%*	*16%*	*0%*	*0%*
3	*Rich-Morgan-Summit*	*217,033*	*79%*	*17%*	*0%*	*0%*
3	*Hamlin Valley*	*341,270*	*60%*	*1%*	*1%*	*0%*
3	*Ibapah*	*98,574*	*0%*	*0%*	*0%*	*0%*
3	*Sheeprock Mountains*	*611,374*	*98%*	*0%*	*0%*	*0%*
5	*Klamath OR/CA*	*162,667*	*98%*	*0%*	*0%*	*0%*

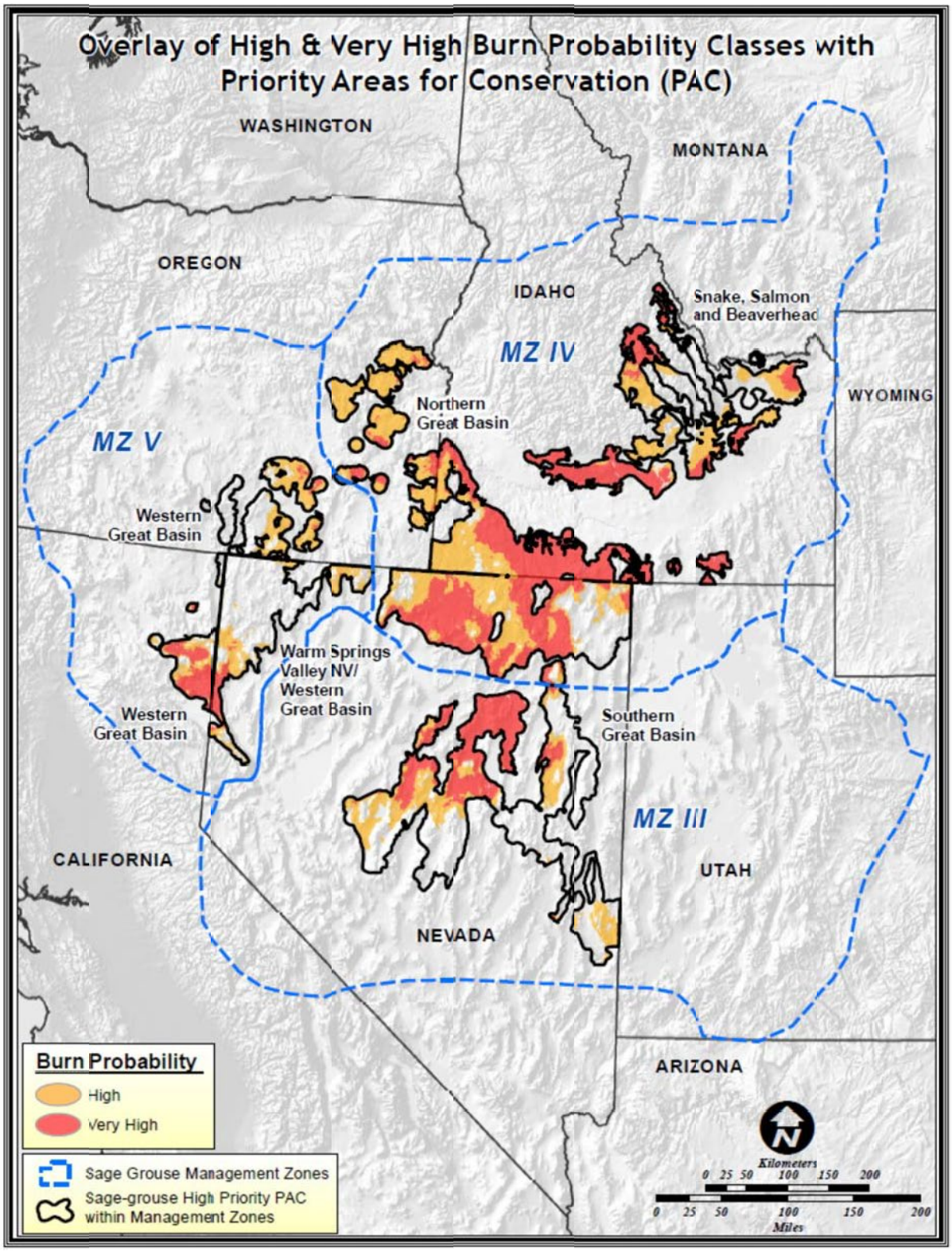


Figure 10, Burn Probability (high and very high) in priority invasive annual grass and wildfire PACs. .

Conifer Expansion. (See priority PACs for assessment identified in Table 4 and focal habitats shown in Figure 9). Focal habitats, as they relate to conifer expansion, are defined as sage-grouse habitat in a priority PAC with sagebrush landscape cover between 25 and 100 percent that is either near or in a conifer expansion area. The relationship between conifer expansion and resilience to disturbance and resistance to expansion is not documented to the same degree as with invasive annual grasses. However, Appendix 5 (D. and E.) in Chambers et al. 2014) includes two generalized state and transition models for conifer expansion with warm to cool and soil temperature regimes associated with precipitation ranges from 12 to 14 or more inches of annual precipitation. These state and transition models are useful in developing management strategies to deal with conifer expansion as they contain useful restoration pathways.

Chambers et al. 2014) is recommended for review at this point for information on applying resistance and resilience concepts along with sage-grouse habitat characteristics to develop management strategies to address wildfires, invasive annual grasses, and conifer expansion. The following tables are recommended for use in developing management strategies in or near focal habitats:

Table 1. Soil temperature and moisture regimes relationship to vegetation types and resistance and resilience.
Table 2. Sage-grouse habitat matrix showing the relationship between landscape sagebrush cover and resistance and resilience.
Table 3. Potential management strategies based on sage-grouse habitat requirements and resistance and resilience.
Table 4. Management strategies (fire suppression, fuels management, post-fire rehabilitation, and habitat restoration) associated with each cell in the sage-grouse habitat matrix (Table 2).

The "Putting it all together" section of the Chambers et al. 2014) also contains a case study from Northeast Nevada illustrating applications of management strategies to address the conservation, protection, and restoration of sage-grouse habitat.

To further assist in understanding Step 1b, examples of general priorities for management strategies are provided below and illustrated in Appendix 3 and 4:

1. Fuels Management: Projects that are designed to change vegetation composition and/or structure to modify potential fire behavior for the purpose of improving fire suppression effectiveness and limiting fire spread and intensity.
    a. Identify priorities and potential measures to reduce the threats to sage-grouse habitat resulting from changes in invasive annual grasses (primary focus on exotic annual grasses and conifer encroachment) and wildland fires. Place high priority on areas dominated by invasive annual grasses that are near or adjacent to low resistance and resilience habitats that are still intact.
    b. Areas on or near perimeter of successful post-fire rehabilitation and habitat restoration projects where threats of subsequent fire are present are important for consideration.

c. Fuels management can be a high priority in large tracts of intact sagebrush if impacts on sage-grouse populations are minimal and outweighed by the potential benefits of reduced wildfire impacts in area being protected.

2. Habitat Recovery/Restoration Recovery (passive restoration) is a high priority in intact sagebrush stands to improve resistance and resilience before a disturbance. For example, where understory perennial herbaceous species are limited, improved livestock grazing practices can increase the abundance of these species and promote increased resistance to annual grasses.
    a. Habitat restoration is important where habitat connectivity issues are present within focal habitats.
    b. Pinyon pine and/or juniper removal in Phase I and II stands adjacent to large, contiguous areas of sagebrush (greater than 25 percent sagebrush landscape cover) is a priority.

3. Fire Operations (includes preparedness, prevention and suppression activities).
    a. Higher priority should be placed on areas with greater than 65 percent cover than on areas with 25 to 65 percent cover, followed by 0 to 25 percent cover (these categories are continuums not discrete thresholds).
    b. Higher priority should be placed on lower resistance/resilience habitats compared with higher resistance/resilience habitats.
    c. Fire operations in areas restored or post-fire rehabilitation treatment where subsequent wildfires can have detrimental effect on investment and recovery of habitat are important for consideration.
    d. Fire operations (suppression) are especially important in low elevation winter sagebrush habitat with low resistance and resiliency.
4. Post-Fire Rehabilitation
    a. High priority should be placed on supporting short-term natural recovery and long-term persistence in higher resistance and resiliency habitats (with appropriate management applied).
    b. High priority should be placed on reseeding in moderate to low resistance and resiliency habitats, but only if competition from invasive annual grasses, if present, can be controlled prior to seeding.

Step 2

Step 2 is carried out by local management units using the Step 1 geospatial data, focal habitats, and the associated management strategies. Step 2 includes evaluating the availability and accuracy of local information and geospatial data used to develop local management strategies in or near focal habitats (Step 2a).

It also involves developing focal habitat activity/implementation plans that include prioritized management tactics and treatments to implement effective fuels management, habitat

recovery/restoration, fire operations, and post-fire rehabilitation (Step 2b). These activity/implementation plans will serve as the basis for NEPA analysis of site-specific projects.

Step 2a- Review of Step 1 Data and Incorporation of Local Information

Evaluate the accuracy and utility of Step 1 geospatial layers for focal habitats by incorporating more accurate or locally relevant:

- Vegetation maps (especially sagebrush cover)
- Updated or higher resolution conifer expansion layers (if applicable)
- Soil survey and ecological site descriptions
- Weather station, including Remote Automatic Weather Stations, data
- PACs, focal habitats, winter habitats, sage-grouse population distributions (i.e., more recent BBD surveys)
- Maps of cheatgrass and other invasive annual grasses that degrade sage-grouse habitat
- Wildfire polygons including perimeters and unburned islands within burn polygons
- Treatment locations and success (consult US Geological Survey Land Treatment Digital Library at http://ltdl.wr.usgs.gov/). The Land Treatment Digital Library allows the user to search on treatment results on an ecological site basis.
- Models and tools to help inform management strategies. For example, data which characterizes wildfire potential can help identify risk to focal habitats and help plan fire suppression and fuels management strategies to address these risks.
- Rapid Ecoregional Assessments
- Land Use Plans
- Appropriate monitoring or inventory information
- Any other geospatial data or models that could improve the accuracy of the assessment process

It is essential that subregional or local information and geospatial data be subjected to a quality control assessment to ensure that it is appropriate to use in developing Step 2b activity and implementation plans. Since PACs and focal habitats usually transcend multiple administrative boundaries, a collaborative approach is highly recommended for Step 2a.

A series of questions tied to the management strategies described in the Introduction section follows to assist managers in developing the framework to complete Step 2b (development of activity/implementation plans). The questions that follow apply to the focal habitats (and buffer areas around focal areas where management strategies may be more effectively applied) and will help in developing coordinated implementation/activity plans. These questions should not limit the scope of the assessment and additional questions relative to local situations are encouraged. These questions portray the minimum degree of specificity for focal habitats in order for offices to complete Step 2a.

Fuels Management

1. Where are the priority fuels management areas (spatially defined treatment opportunity areas that consider fire risk, fuels conditions, and focal habitats [including areas adjacent to focal habitats])?
2. Based on fire risk to focal habitats, what types of fuels treatments should be implemented to reduce this threat (for example, linear features that can be used as anchors during suppression operations)?
3. Considering resistance/resilience concepts and the landscape context from Step 1, where should treatments be applied in and around focal habitats to:
    a. Constrain fire spread?
    b. Reduce the extent of conifer expansion?
    c. Augment future suppression efforts by creating fuel breaks or anchors for suppression?
4. Based on opportunities for fire to improve/restore focal habitats, what types of fuels treatments should be implemented to compliment managed wildfire by modifying fire behavior and effects?
5. Are there opportunities to utilize a coordinated fuels management approach across jurisdictional boundaries?
6. What fuel reduction techniques will be most effective that are within acceptable impact ranges of local sage-grouse populations, including but not limited to grazing, prescribed fire, chemical, and biological and mechanical treatments? Will combinations of these techniques improve effectiveness (e.g., using livestock to graze fine fuels in a mowed fuel break in sagebrush)?

Habitat Recovery/Restoration

1. Are there opportunities for habitat restoration treatments to protect, enhance or maintain sage-grouse focal habitat especially to restore connectivity of focal area habitat?
2. Considering the resistance and resilience GIS data layer (Figure 4) and the Sage-Grouse Habitat Matrix (Chambers et al. 2014; Table 2), where and why would passive or active restoration treatments be used?
3. What are the risks and opportunities of restoring habitat with low resistance and resilience including the warm/dry and cool/dry soil moisture/temperature regime areas?
4. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries to effectively complete habitat restoration in focal habitats?

Fire Operations

1. Where are priority fire management areas (spatially defined polygons having the highest need for preparedness and suppression action)?

2. Where are the greatest wildfire risks to focal habitats considering trends in fire occurrence and fuel conditions (see Figure 10)?
3. Where do opportunities exist that could enhance or improve suppression capability in and around focal habitats?
    a) For example, increased water availability through installation of helicopter refill wells or water storage tanks.
    b) Decreased response time through pre-positioned resources or staffing remote stations.
4. Should wildfire be managed (per land use plan objectives) for improving focal habitat (e.g., reducing conifer expansion), and if so where, and under what conditions?
5. How can fire management be coordinated across jurisdictional boundaries to reduce risk or to improve focal habitats?

Post-fire Rehabilitation

1. Where are areas that are a high priority for post-fire rehabilitation to improve habitat connectivity if a wildfire occurs?
2. Which areas are more conducive (higher resistance and/or resilience) to recovery and may not need reseeding after a wildfire?
3. What opportunities to build in fire resistant fuel breaks to reduce the likelihood of future wildfires impacts on seeded or recovering areas?
4. Are there opportunities to utilize a coordinated approach across jurisdictional boundaries to implement rehabilitation practices?

The outcome of Step 2a is the assembly of the pertinent information and GIS layers to assist managers in developing implementation or activity plans to address wildfires, invasive annual grasses, and conifer expansion in focal habitats. Activity plans generally refer to plans where management of a resource is changed (livestock grazing plans) whereas implementation plans are generally associated with treatments.

Step 2b- Preparation of Activity/Implementation Plans

Activity/implementation plans are prepared to implement the appropriate management strategies within and adjacent to focal habitats. Since focal habitats cross jurisdictional boundaries, it is especially important that a collaborative approach be used to develop implementation/activity plans. The process of identifying partners and creating collaborative teams to develop these plans is a function of state, regional, and local managers and is not addressed as part of this step.

Implementation/activity plans are required to:

1. Address issues in and around focal habitats related to wildfires, invasive annual grasses, and conifer expansion

2. Use resistance to invasive annual grasses and resilience after disturbance (where appropriate) as part of the selection process for implementing management strategies
3. Emphasize application of management strategies within or near focal habitats with low resistance and resilience (warm/dry and cool/dry soil moisture/temperature regimes) invasive annual grasses and wildfires
4. Use the best available local information to inform the assessment process
5. Encourage collaboration and coordination with focal habitats across jurisdictional boundaries
6. Be adaptive to changing conditions, disturbances, and modifications of PAC boundaries

FIAT recommends considering other factors, such as adaptive management for climate change, local sagebrush mortality due to aroga moth or other pests, and cheatgrass die-off areas in developing activity/implementation plans. The latter two factors could influence where and what kind of management strategies may be needed to address the loss of habitat or changes in fuel characteristics (e.g., load and flammability) associated with these mortality events.

The following recommendations are provided to assist in the preparation of activity/implementation plans:

Fuels Management

1. Spatially delineate priority areas for fuel management treatments per Step 2a information considering:
    a. Linear fuel breaks along roads
    b. Other linear fuel breaks to create anchor points
    c. Prescribed burning which would meet objectives identified in the Fish and Wildlife Service's Conservation Objectives Team (COT) report
    d. Mechanical (e.g., treatment of conifer expansion into sagebrush communities)
    e. Other mechanical, biological, or chemical treatments
    f. If they exist, spatially delineated areas where fuel treatments would increase the ability to use fire to improve/enhance focal habitats.
2. Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of fuels treatments.
3. Quantify a projected level of treatment within or near focal habitats.
    a. Identify treatments (projects) to be planned within or near focal habitats.
    b. Include a priority and proposed work plan for proposed treatments.

Habitat Recovery/Restoration

1. Spatially delineate priority areas for restoration, using criteria established in Step 2a. Priority areas for restoration should be delineated by treatment methods:
    a. Seeding priority areas
    b. Invasive annual grasses priority treatment areas (herbicide, mechanical, biological, combination)

c. Priority areas requiring combinations of treatments (e.g., herbicide followed by seeding).
d. Include tables, maps or appropriate info.

2. Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of restoration treatments.
3. Include a priority or implementation schedule for proposed restoration treatment

Fire Operations

1. Spatially delineate priority areas for fire suppression, based upon criteria established in Step 2a. Priority areas for fire operations should be delineated by type, such as:
    a. Initial attack priority areas
    b. Resource pre-positioning and staging priority areas
2. Spatially delineate areas where opportunities exist to enhance or improve suppression capability.
3. Spatially delineate areas where wildfire can be managed to achieve land use plan and COT objectives.

Post-Fire Rehabilitation

1. Spatially delineate priority areas for post-fire rehabilitation using criteria in Step 2a.
2. Priority areas for post-fire rehabilitation should be based on resistance and resiliency and pre-fire landscape sagebrush cover and include consideration of:
    a. Seeding priority areas
    b. Invasive annual grasses priority treatment areas (herbicide, mechanical, biological (herbivory or seeding),
    c. Priority areas requiring combinations of treatments (e.g., herbicide followed by seeding)
3. Identify coordination needed between renewable resource, fire management, and fuels management staff to facilitate planning and implementation of post-fire rehabilitation treatments.

This completes the assessment process and sets the stage for more detailed project planning and NEPA associated with implementing on-the-ground treatments and management changes.

Members of the FIAT Development and Review teams are listed in Appendix 5.

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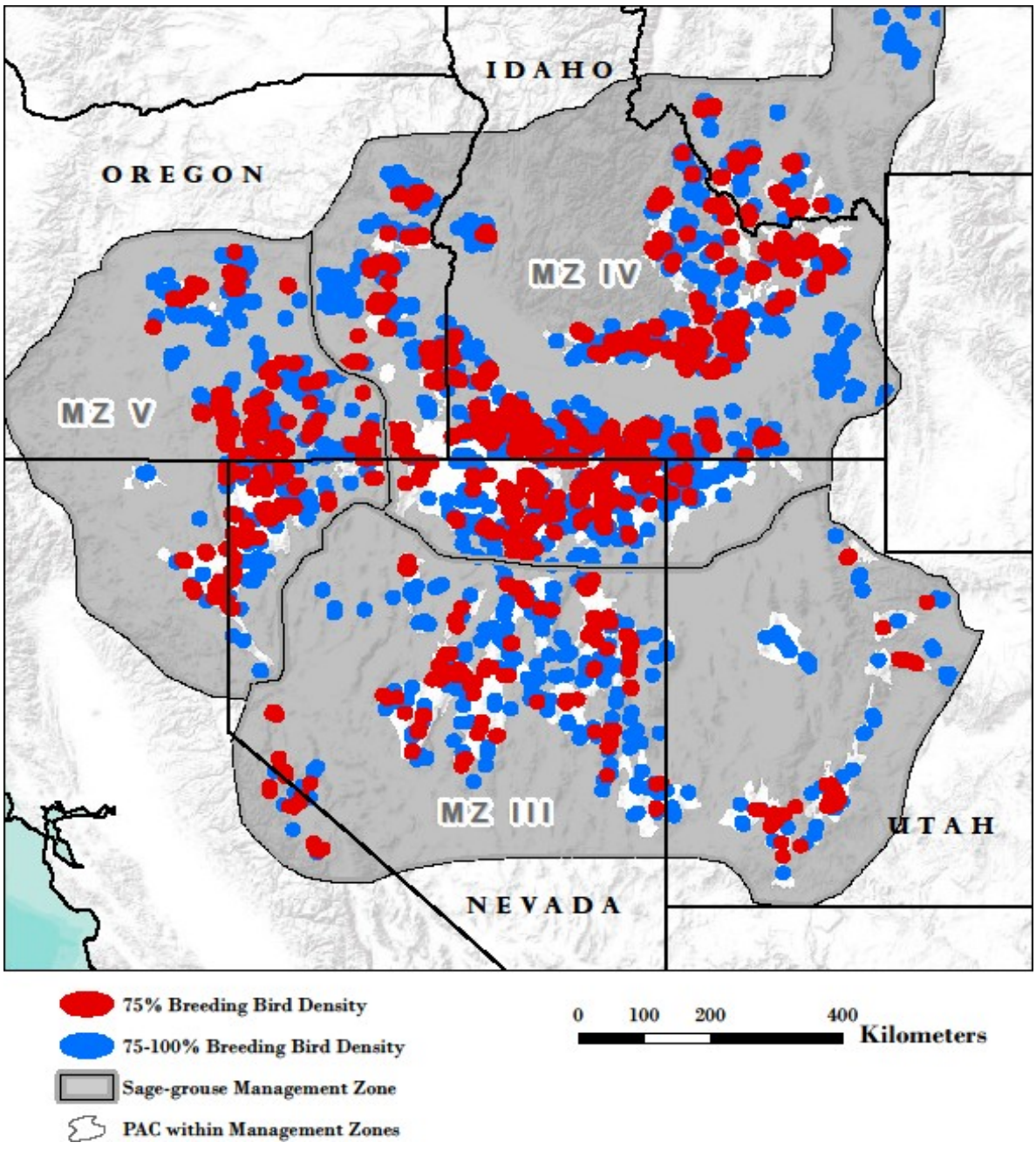
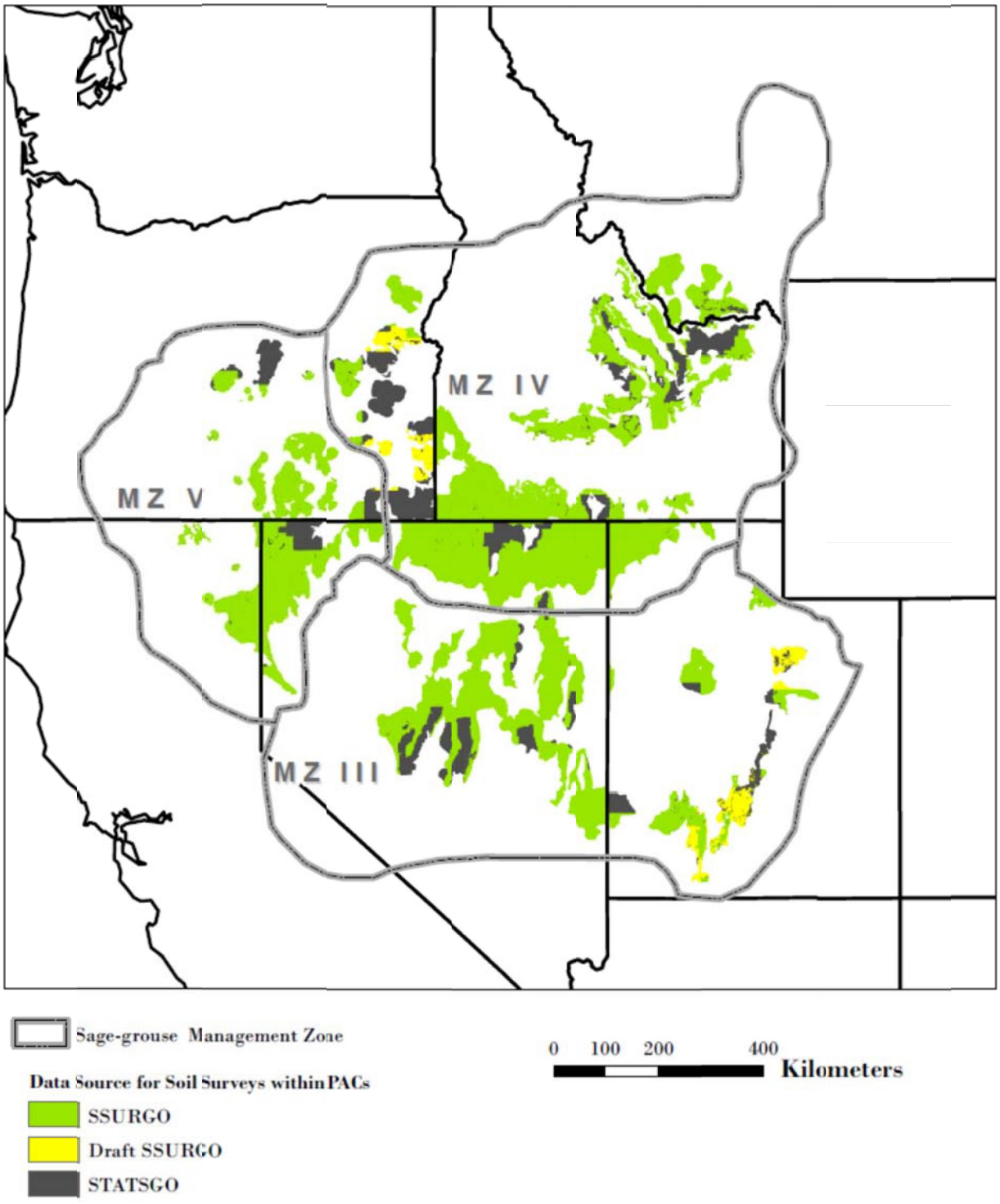
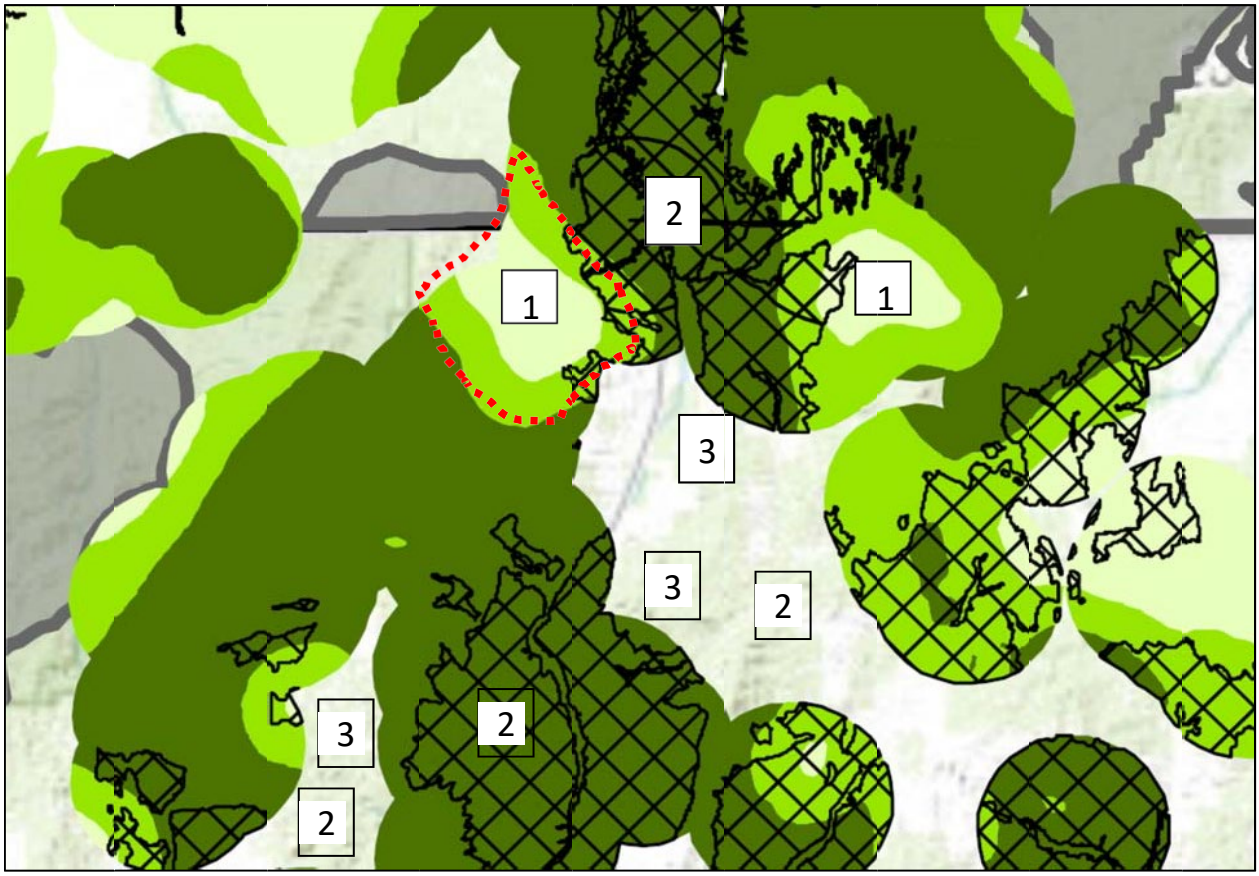
Appendix 1. Sage-grouse breeding bird density thresholds for 75% and 100% of the breeding birds, Management Zones, and PACs. Breeding bird density of 75 to 100% is included in this figure to provide context for local management units when making decisions concerning connectivity between populations and PACs.

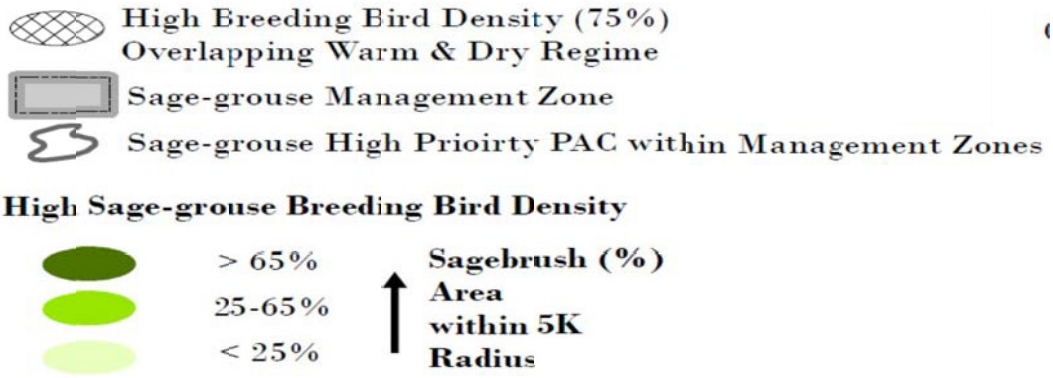


Appendix 2. Gaps in SSURGO soil survey data in Management Zones III, IV, and V. STATSGO2 soil survey data used to fill these gaps.



Appendix 3. Example of potential management strategies applied to Wil**d**fire/Invasive Annual Grass Scenario.



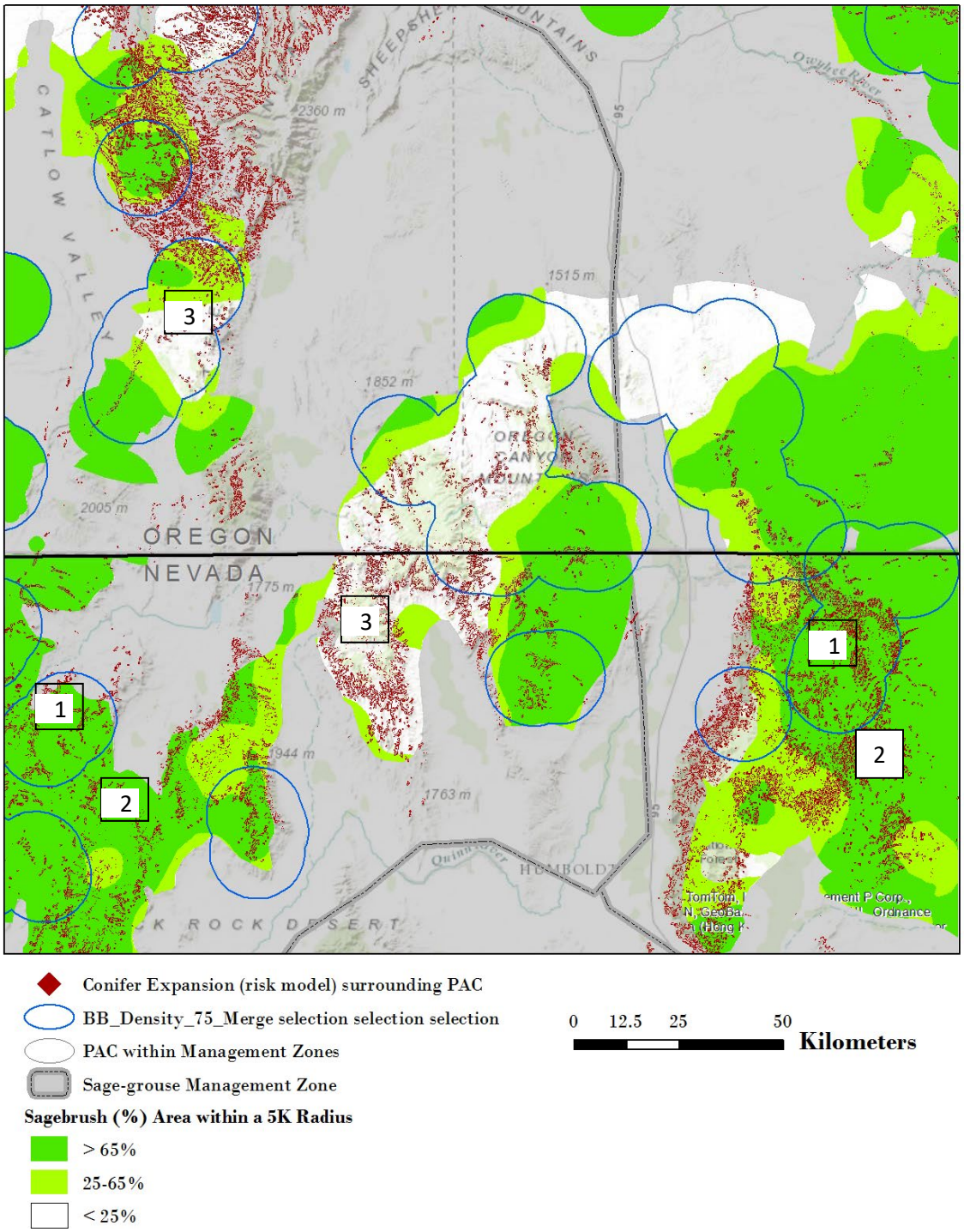


1 High priority for habitat restoration and post-fire rehabilitation to restore connectivity.

2 High priority for fire suppression within and around area given >65% sag**e**brush landscape cover and low resistance/resilience.

3 **High priority for fuels management to reduce likelihood of wildfires in low resistance/resilience habitat** with >65% landscape cover.

Appendix 4. Management strategy example for Western Juniper expansion.



1 High priority (emphasis area) for juniper control (>25% landscape sagebrush cover & 75% BBD)

2 Moderate priority (emphasis area) for juniper control (>25% landscape sagebrush cover)

3 Very low priority (<25% landscape sagebrush cover)

Appendix H

Cumulative Effects Supporting Information

Appendix H. Cumulative Effects Supporting Information

Table 4-5 represents the past, present, and reasonably foreseeable actions across the entire range for Greater Sage-Grouse, which are separated by state. When assessing the cumulative impact of this Proposed RMPA/Final EIS on Greater Sage-Grouse and its habitat, there are multiple geographic scales that the BLM has considered, including the appropriate Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ). WAFWA MZs have biological significance to Greater Sage-Grouse. Established and delineated in 2004 in the *Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats* (Connelly et al. 2004), the WAFWA MZs are based on floristic provinces that reflect ecological and biological issues and similarities, not political boundaries.

Table 4-1
Range-Wide Impacts from Past, Present, and Reasonably Foreseeable Future Actions

Action	Type	Effects
Great Basin		
Habitat Restoration Programmatic EIS	Great Basin-wide programmatic habitat restoration project	Programmatic document effects would be realized when the field implements projects. This action would provide opportunities to improve and enhance habitat through vegetation treatments.
Fuel Breaks Programmatic EIS	Great Basin-wide programmatic habitat fuel break project	Programmatic document effects would be realized when the field implements projects. This action would help to reduce the loss of habitat due to catastrophic fires.
Northwest Colorado		
Integrated program of work	Habitat restoration and improvement projects	Potential localized, short-term, adverse impacts on Greater Sage-Grouse habitat, with beneficial long-term impacts. Actions are consistent with those foreseen in the 2015 Final EIS and are therefore within the range of cumulative effects analyzed in the 2015 Final EIS.
Travel management	White River Field Office: Area-wide travel designations being considered through an ongoing plan amendment Little Snake Field Office: Travel Management plan, identifying route designations consistent with criteria in the 2015 Final EIS	These actions represent implementation of objectives from the 2015 Final EIS to prioritize travel management in Greater Sage-Grouse habitat. Impacts are covered in the cumulative impacts of the 2015 Final EIS as reasonably foreseeable.

Action	Type	Effects
Continued oil and gas development	Disturbance and fragmentation	Development is consistent with the reasonably foreseeable development scenarios analyzed as part of the 2015 Final EIS and the associated field office RMPs. Additional impacts are expected to be within the range analyzed in 2015 Final EIS cumulative impacts analysis.
Plans		
Northwest Colorado Programmatic Vegetation Treatment Environmental Assessment (DOI-BLM-CO-N000-2017-0001-EA) decision	Programmatic NEPA document for streamlining habitat treatments in sagebrush	
Idaho		
Wildland fires 2015–2017	BLM: Past acres burned on BLM-administered land	534,744 acres of HMA burned since the ROD was signed in 2015. Post-fire rehabilitation was implemented. Too soon to determine the effectiveness of rehabilitation.
Habitat treatments 2015–2017	BLM: Past habitat improvement projects	431,295 acres treated to restore or improve potential Greater Sage-Grouse habitat. Too soon to determine the effectiveness of treatment.
ROWs issued 2015–2017	BLM: Past ROWs issued on BLM-administered land	97 ROWs were issued in the planning area but fewer than 10 were in Greater Sage-Grouse habitat and resulted in new habitat loss. The effects were mitigated, using the mitigation hierarchy.
Soda Fire restoration	BLM: Present habitat restoration and fuel break construction	Restoration of previously burned Greater Sage-Grouse habitat. Results in a net benefit to Greater Sage-Grouse habitat.
Twin Falls Vegetation Project	BLM: Present habitat treatment project that improves Greater Sage-Grouse habitat district-wide	Restoration of Greater Sage-Grouse habitat and improved rangeland conditions. Results in a net benefit to Greater Sage-Grouse habitat.
Idaho Falls Vegetation Project	BLM: Present habitat treatment project that improves Greater Sage-Grouse habitat district-wide	Restoration of Greater Sage-Grouse habitat and improved rangeland conditions. Results in a net benefit to Greater Sage-Grouse habitat.
Natural gas-producing well near Weiser, Idaho	Private: Present active gas well on private land	Well is not in Greater Sage-Grouse habitat.
Conifer removal	NRCS: Present (2018) 1,862 acres of conifer removal on private land to improve Greater Sage-Grouse habitat	Conifer removal would improve Greater Sage-Grouse habitat and open areas to Greater Sage-Grouse that were previously unavailable because of juniper encroachment.
Weed treatments	NRCS: Present (2018) 95 acres of weed treatments on private land to reduce noxious weeds in Greater Sage-Grouse habitat	Weed treatments allow the native vegetation to outcompete weeds on treated acres.

Action	Type	Effects
Water development	NRCS: Present (2018) 21,308 feet of pipeline and 40 watering tanks installed on private land	Water development to move livestock out of natural springs and wet meadows.
Pending ROWs 2015–2017	BLM: Future ROW under analysis on BLM-administered land	123 ROW applications have been submitted and are pending review and analysis.
Boise District Vegetation Project	BLM: Future habitat treatment project that improves Greater Sage-Grouse habitat district-wide	Restoration of Greater Sage-Grouse habitat and improved rangeland conditions result in a net benefit to Greater Sage-Grouse habitat.
Tristate Fuel Breaks Project	BLM: Future Greater Sage-Grouse habitat protection	Fuel breaks would protect habitat from wildfires. Some sagebrush may be lost during fuel break construction. Results in a net benefit to Greater Sage-Grouse habitat.
Bruneau-Owyhee Sage-Grouse Habitat Project (BOSH)	BLM: Future removal of juniper encroaching into Greater Sage-Grouse habitat	BOSH would remove encroaching juniper from Greater Sage-Grouse habitat and render the habitat usable for Greater Sage-Grouse. Results in a net benefit to Greater Sage-Grouse habitat.
Conifer removal	NRCS: Future (2019–2023) 5,541 acres of conifer removal on private land to improve Greater Sage-Grouse habitat	Conifer removal would improve Greater Sage-Grouse habitat and open areas to Greater Sage-Grouse that were previously unavailable because of juniper encroachment.
Weed treatments	NRCS: Future (2019–2023) 357 acres of weed treatments on private land to reduce noxious weeds in Greater Sage-Grouse habitat	Weed treatments allow the native vegetation to outcompete weeds on treated acres.
Water development	NRCS: Present (2019–2023) 82,502 feet of pipeline and 46 watering tanks installed on private land	Water development to move livestock out of natural springs and wet meadows.
Nevada and Northeast California		
Wildland Fires 2015-2017	BLM: Past – Acres burned on BLM administered land	Approximately 1.3 million acres of HMA burned between 2015-2017. Post fire restoration is being implemented as described below.
Fire Restoration (Emergency Stabilization and Rehabilitation)	BLM: Past and Present – Habitat restoration following wildland fires	1.8 million acres of habitat are either currently being treated or scheduled to be treated according to specific prescriptions outlined in Emergency Stabilization and Burned Area Rehabilitation plans following wildfire.
Habitat Treatments	BLM: Past – Habitat improvement projects	Over 176,000 acres of Greater Sage-Grouse habitat was treated between 2015-2017 to maintain or improve conditions for Greater Sage-Grouse. Treatments included conifer removal, fuel breaks, invasive species removal and habitat protection/restoration.

Action	Type	Effects
Land Use and Realty (issued and pending) 2015-2018	BLM: Past ROWs issued on BLM-administered lands	227 ROWs were issued in the planning area between 2015-2017. This includes amendments and reauthorizations, which may not have resulted in new disturbance. For ROWs occurring in Greater Sage-Grouse habitat, effects were offset using the mitigation hierarchy.
	BLM: Future pending	85 ROW applications are pending review and analysis. For ROWs occurring in Greater Sage-Grouse habitat, effects were offset using the mitigation hierarchy. In addition, BLM Nevada is also currently evaluating a proposed withdrawal for expansion of the Fallon Naval Air Station, Fallon Range Training Complex for defense purposes.
Oil and Gas	BLM: Past	BLM has offered for lease 425,711 acres in HMAs; 407,478 of that total was leased. Lease stipulations apply as described in the leases according to HMA category.
	BLM: Future pending	BLM scheduled a lease sale in June 2018 that would offer 110,556 acres in HMAs. Lease stipulations would still be as described in 2015 Final EIS until a decision is made on this Proposed RMPA/Final EIS.
Geothermal	BLM: Past and Present	Between 2015 and 2017, the BLM has offered for lease 24,468 acres within HMAs. Lease stipulations apply as described in the leases as analyzed in the 2015 Final EIS. 6 geothermal development permits have been approved and drilled on existing pads on existing leases. McGinness Hills Phase 3 EA authorized up to 42 acres of disturbance on existing leases, which would be offset according to the mitigation hierarchy.
Geothermal	Forest Service: Future Pending	6,901 acres of HMA pending Forest Service concurrence to lease, no pending geothermal development permits. If in HMAs, stipulations would be as described in 2015.

Action	Type	Effects
Locatable Mineral Projects	BLM: Past and Present	Between 2015 and 2017, the BLM has approved 18 new mines and/or expansions in the planning area, which is within the reasonably foreseeable development scenario outlined in the 2015 Final EIS (Section 5.1.16).
	BLM: Future Pending	The BLM is currently reviewing 20 plans of development for new mines or expansions, which is within the reasonably foreseeable development scenario outlined in the 2015 Final EIS (Section 5.1.16).
Fuel Breaks PEIS	BLM: Future – Great Basin-wide programmatic habitat fuel break project	Programmatic document effects would be realized when the field implements projects.
Greater Sage-Grouse Conservation	Forest Service- Future	Forest Service has indicated they would also be amending their land use plans. Specific details of their proposed changes are not yet known, but it is anticipated they propose alignment with state management plans and strategies.
Oregon		
Emergency Stabilization and Rehabilitation in South Bull Ridge RNA	Aerial herbicide application	Preliminary results indicate success in treating annual grasses (2017).
Emergency Stabilization and Rehabilitation in South Ridge Bully Creek RNA	Aerial herbicide application	Preliminary results indicate success in treating annual grasses (2015).
Emergency Stabilization and Rehabilitation in North Ridge Bully Creek RNA	Aerial herbicide application	Preliminary results indicate success in treating annual grasses (2015).
Trout Creek Mountain	Grazing permit renewal	Grazing permit renewal allotment includes the East Fork Trout Creek RNA (2016).
Utah		
Fire and Fuels		
Wildland Fires 2015-2017	Acres burned on BLM administered land	Approximately 61,262 acres of PHMA/GHMA burned between 2015-2017. Post fire restoration is being implemented across all population areas that are affected. Effects: Potential loss of Greater Sage-Grouse habitat value due to the removal of vegetation by fire.

Action	Type	Effects
Fire Restoration (Emergency Stabilization and Rehabilitation)	Acres of habitat restoration following wildland fires	Approximately 173,100 acres of HMA were treated/restored between 2015-2017. All of these acres are being restored in according to specific prescriptions outlined in Emergency Stabilization and Burned Area Rehabilitation plans following wildfire across all population areas that are affected. Effect: Potentially improve or increase habitat due to vegetative restoration activities.
Vegetation		
Habitat Treatments	Acres of habitat improvement projects	Past: Over 219,000 acres of Greater Sage-Grouse habitat was treated between 2015-2017 to maintain or improve conditions for Greater Sage-Grouse across all populations. Treatments included conifer removal, fuel breaks, invasive species removal and habitat protection/restoration. Effect: Potentially improve or increase habitat due to vegetative restoration activities. Future: Over 524,702 acres of Greater Sage-Grouse habitat is being proposed for treatment over the next 5 years. Treatments would include conifer removal, fuel breaks, invasive species removal and habitat protection/restoration across all populations. Effect: Potentially improve or increase habitat due to vegetative restoration activities.
Lands and Realty		
Land Use and Realty (issued and pending) 2015-2018	ROWs issued or pending on BLM land	Past: Issued 841 ROWs in the planning area between 2015 and 2017. Effect: This includes amendments and reauthorizations, which may not have resulted in new disturbance. For ROWs occurring in Greater Sage-Grouse habitat, effects were offset using the mitigation hierarchy. Future: 380 ROW applications are pending review and analysis. Effect: New ROWs would be held to the same mitigation standard under the management alignment alternative as described in the 2015 EIS, so no additional cumulative impacts beyond those described in 2015 are anticipated.

Action	Type	Effects
Zephyr Transmission Line	500 kV transmission line	Application received – could impact the Bald Hills, Uintah, Carbon, Strawberry, Emery, and Sheeprocks populations. Effects: May remove vegetation due to construction activities. Towers may provide perching opportunities for avian predators. However, most of these impacts should be removed by management standards identified in the selected alternative.
Parker Knoll Pump Storage Hydroelectric Federal Energy Regulatory Commission Project	Create electricity using a two-reservoir, gravity-fed system; approximately 200 acres of Greater Sage-Grouse habitat would be lost; mitigation involves Greater Sage-Grouse habitat-improvement work in areas adjacent to the lost habitat.	Still in planning and NEPA stages – could impact the Parker Mountain population. Effects: May remove vegetation due to construction activities. Increased maintenance activities could lead to an increase in collision mortalities. Any associated tall structures may provide perching opportunities for avian predators. However, most of these impacts should be removed by management standards identified in the selected alternative.
Enefit Utility Project	Five rights-of-way across public lands for infrastructure (a road, 3 pipelines, and 2 powerlines) to support development of a mine on private lands. Estimated 1,037 acres of disturbance for the ROWs (7,000-9,000 acre mine and 320-acre processing plant).	Still in planning and NEPA stages – could impact the Uintah population. Effects: May remove vegetation due to construction activities. Increased maintenance activities could lead to an increase in collision mortalities. Any associated tall structures may provide perching opportunities for avian predators. However, most of these impacts should be removed by management standards identified in the selected alternative.

Action	Type	Effects
Leasable Minerals (Oil and Gas, Non-energy Leasable Minerals, Coal, and Oil Shale and Tar Sands)		
Oil and Gas Leases	Acres of BLM land leased for Oil and Gas development	Past: From 2105-2017 the BLM has leased approximately 25,000 acres in HMAs, of which approximately 25 of those acres were located in PHMA. Lease stipulations apply as described in the leases according to HMA category. Effects: The act of leasing would have no direct effect. Future: BLM scheduled a lease sale in June 2018 that would offer 646 acres in HMAs. Additionally, the BLM is required to conduct quarterly lease sales which could include parcels in HMA. Lease stipulations would still be as described in 2015 until a decision is made on the 2018 Proposed RMPA/Final EIS. Effect: The act of leasing would have no direct effect, as no specific disturbance is taken as a result of purchasing a lease. Leasing could occur in any of the Greater Sage-Grouse populations, but would be most likely to impact the Uintah, Carbon, Emery, and Rich populations due to mineral potential.
Oil and Gas Wells	Oil and Gas exploration and development	Based upon the reasonable and foreseeable development assumptions in **Chapter 4**, it is anticipated that 2,968 oil and gas wells would be drilled within occupied Greater Sage-Grouse habitat within the population areas of which 2,289 wells are anticipated to be producing wells. Exploration wells are expected in all populations. Development wells are anticipated in Uintah, Carbon, Emery, and Rich populations. Effect: The development of wells within these areas could lead to fragmentation and loss of habitat due to construction activities. Increased noise levels associated with traffic and compressors may impact lek attendance and increased predation. Increased traffic associated with day to day operations may also increase the potential for collision mortality. However, most of these impacts should be removed by management standards identified in the selected alternative.

Action	Type	Effects
Asphalt Ridge Tar Sands Development	Lease approximately 6,000 acres of Tar Sands Lands described in the Asphalt Ridge Tract, which is directly adjacent to ~16,000 acres of existing State leases	Still in planning and NEPA stages – could impact the Uintah Greater Sage-Grouse population. Effect: As a largely underground operation on BLM-administered lands, this would disturb a small amount of land associated with ancillary features. On the portions of the mine that would be mined through surface means, habitat would be lost and noise, dust, and light would affect adjacent areas.
Flat Canyon Coal Lease by application	The Flat Canyon Coal Lease Tract is approximately 2,692 acres of federal coal reserves	Forest Service completed the consent to BLM. Approximately 23 acres out of the 2,692 acres are within the Emery Greater Sage-Grouse Population Area. Effect: The act of leasing would have no direct effect. However, the activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Alton Coal Tract Lease-by-Application	Add 3,576 acres of federal surface or mineral estate to an existing 300-acre mine on private land.	Still in planning and NEPA stages – could impact the Panguitch Greater Sage-Grouse population. Effect: Activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Williams Draw Coal Lease by Application	The proposed action includes 4,200 acres of federal surface and mineral estate; the proposal may have several vents, drilling exploration holes on the surface and underground, and load-out facilities	Still in planning and NEPA stages; could impact the Carbon Greater Sage-Grouse population. Effect: The act of leasing would have no direct effect. However, the activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.

Action	Type	Effects
Greens Hollow Coal Lease by Application	Proposal includes 6,700 acres; a vent is proposed off site; minimal surface disturbances with the exception for exploration drilling	The area has been leased, but development is on hold due to litigation. Proposal would affect the Emery Greater Sage-Grouse population. Effect: Activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Flat Canyon Coal Lease by Application	Lease by Application 3,792 acres; and Exploration License, 595 acres	Leased and under production in the Carbon Greater Sage-Grouse population. Effect: The act of leasing would have no direct effect. However, the activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Gilsonite Leasing	16,810 acres that are currently under prospecting permit application; the permits would either be issued or a Known Gilsonite Leasing Area would be established, thus allowing competitive leasing	The prospecting permit applications have been in place since the late 1980s; Known Gilsonite Leasing Area report ongoing, after which NEPA would begin to address backlogs for these areas in the Uintah Greater Sage-Grouse population. Effect: Activities associated with development or prospecting of the permit/lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Phosphate Fringe Acreage Lease	1,627 acres of fringe acreage lease on BLM-administered lands	NEPA has started and awaiting a Development Scenario to complete the NEPA for this area in the Uintah Greater Sage-Grouse population. Effect: The act of leasing would have no direct effect. However, the activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.

Action	Type	Effects
Phosphate Competitive Lease Application	1,186 acres on National Forest System lands	NEPA has started and awaiting a Development Scenario to complete the NEPA for this area in the Greater Sage-Grouse Uintah population. Effect: Activities associated with development of the lease could result in loss of habitat and vehicle mortality due to increased traffic. Most of these impacts should be removed by management standards identified in the selected alternative.
Other Items		
Hard Rock Prospecting Permits being considered on Bankhead Jones	Hard rock exploration permits	Pending Consideration for this area in the Sheeprocks Greater Sage-Grouse population. Effect: Activities associated with development of the lease could result in loss of habitat, vehicle mortality due to increased traffic and disruption of seasonal use areas. Most of these impacts should be removed by management standards identified in the selected alternative.
Gooseberry Narrows Reservoir	Bureau of Reclamation project on Forest Service and private land; project is approximately 1,200 acres	EIS is complete, pending EPA review and approval for this portion of the Carbon Greater Sage-Grouse population. Effect: Activities associated with construction and operation of the reservoir would result in loss of habitat within the project area and a potential increase for vehicle mortality due to increased traffic. However, the habitat lost within the project area may be supplemented by improving the quality and seasonal functionality of the adjacent habitat. Most of the impacts should be removed by management standards identified in the selected alternative.
Motorized Travel Plan Implementation	Implementation of motorized route designation plans across the planning region	Implementation actions underway statewide, with travel planning reasonably foreseeable in the Sheeprocks, Uintah, Carbon and Panguitch Greater Sage-Grouse populations. Effect: The development of a motorized travel plan would potentially help to reduce fragmentation of habitat and centralizing disturbance into areas of lesser importance.

Action	Type	Effects
Grand Staircase-Escalante National Monument Management Plan	Development of a resource management plan	Still in early planning stages for this area that overlaps the Panguitch Greater Sage-Grouse population. Effect: This action would provide a framework to manage both the remaining monument areas and the areas no longer within the monument boundaries. It is too early in the process to determine a cumulative effect since the proposed plan is unknown.
Forest Service Greater Sage-Grouse Planning	Forest Service and Utah Division of Wildlife Resources	Forest Service has indicated they would also be amending their land use plans. Specific details of their proposed changes are not yet known, but it is anticipated they propose alignment with state management plans and strategies. Applicable to all Greater Sage-Grouse populations with National Forest System Lands. Effect: This effort would help to align the Forest Service's plan to be more consistent with the State of Utah's plan and provide the adequate management actions necessary to protect and conserve the Greater Sage-Grouse.
State of Utah Greater Sage-Grouse Management	Update of the State's Conservation Plan for Greater Sage-Grouse in Utah, as well as implementation of the State's compensatory mitigation rule	Past: The Conservation Plan for Greater Sage-grouse in Utah was finalized in 2013; it was designed to be updated every 5 years. While it requires a 4:1 mitigation ratio in the State's Greater Sage-Grouse Management Areas (SGMA), there was no established approach to implement that mitigation standard to the State's 11 SGMAs. Effect: The plan establishes the management actions necessary for the State of Utah to continue to enhance and conserve the Greater Sage-Grouse while still allowing for economic opportunities. Future: The State is updating their Greater Sage-Grouse plan and incorporating the compensatory mitigation rule that provides a process to develop a banking system to apply the state's 4:1 mitigation ratio that is designed to improve habitat for Greater Sage-Grouse. Effect: This effort would help to refine and identify areas to improve management actions and allow for the incorporation of new and local science to better balance Greater Sage-Grouse management across the state. It would also provide an opportunity for economic development to occur while offsetting the impacts to habitat quality.

Action	Type	Effects
Wyoming		
Wildland Fires 2015-2017	BLM: Past – Acres burned on BLM administered land	Approximately 137,000 acres of HMA burned between 2015 and 2017. Post fire restoration and habitat treatments are being implemented, as described below, to diminish impacts of habitat lost to wildland fire.
Fire Restoration (Emergency Stabilization and Rehabilitation)	BLM: Past and Present – Habitat restoration following wildland fires	Approximately 4,030 acres of BLM-administered habitat are either currently being treated or scheduled to be treated according to specific prescriptions outlined in Emergency Stabilization and Burned Area Rehabilitation plans following wildfire.
Habitat Treatments	BLM: Past – Habitat improvement projects	More than 96,000 acres of Greater Sage-Grouse habitat were treated between 2015 and 2017 to maintain or improve conditions for Greater Sage-Grouse. Treatments included conifer removal, fuel breaks, invasive species removal and habitat protection/ restoration.
Land Use and Realty (issued and pending) 2015-2018	BLM: Past ROWs issued on BLM land	BLM Wyoming issued approximately 3,000 ROWs in the planning area between 2015-2017. This includes amendments and reauthorizations, which may not have resulted in new disturbance. For ROWs occurring in Greater Sage-Grouse habitat, effects were offset by the management prescriptions in the RMPs and 2015 Final EIS.
	BLM: Future pending	There are approximately 590 ROW applications pending review and analysis. New ROWs under the Management Alignment Alternative would align with the management prescriptions of the Core Area Strategy and State of Wyoming Mitigation Framework. No additional cumulative impacts are anticipated, beyond those described in 2015.

Action	Type	Effects
Oil and Gas	BLM: Past	BLM Wyoming has offered for lease 861,634 acres; 812,123 acres of that total was leased. Leases followed management prescriptions in the RMPs and 2015 Final EIS and stipulations apply as described in the leases according to HMA categories.
	BLM: Future pending	BLM Wyoming scheduled a lease sale in June 2018 that would offer 198,588 acres for lease. The actions proposed in the Management Alignment Alternative to not propose to change stipulations analyzed in the 2014 and 2015 plans.
Locatable Mineral Projects	BLM: Past and Present	Between 2015-2017, the BLM has approved 17 new mines and/or expansions within the planning area (including non-habitat). The Management Alignment Alternative does not propose changes to any decisions associated with locatable minerals, which were sufficiently analyzed on the existing plans.
	BLM: Future pending	The BLM is currently reviewing 26 plans of operation for new mines, mine expansions and notice-level activities. This number also includes 10 pending mine patents, which are in the process of being patented into private ownership. The Management Alignment Alternative does not propose changes to any decisions associated with locatable minerals, and future impacts would be analyzed in future EISs, adhering to existing requirements of the RMPs and 2015 Final EIS.
Leasable Mineral Projects (Coal)	BLM: Past and Present	Two coal lease modifications were issued in 2018, totaling ~1,307 acres. For lease modifications occurring in Greater Sage-Grouse habitat, effects were offset by the management prescriptions in the RMPs and 2015 Final EIS.
	BLM: Future pending	BLM Wyoming is currently reviewing 4 coal lease applications/modifications totaling ~10,149 acres. No management decisions for leasable minerals are proposed for change under the Management Alignment Alternative.
Greater Sage-Grouse Conservation	Forest Service: Future	Forest Service has indicated they would also be amending their land use plans. Specific details of their proposed changes are not yet known, but it is anticipated they would propose alignment with state management plans and strategies.

Appendix I

VDDT Methodology

APPENDIX I
VDDT METHODOLOGY

GREATER SAGE-GROUSE HABITAT CHARACTERIZATION FOR USE IN NON-SPATIAL VEGETATION MODELING ACROSS THE GREAT BASIN

Don Major[1], Rob Mickelsen[2], Craig Morris[3]

Introduction

Numerous factors influence sagebrush dynamics in the Great Basin. Each year acres of sagebrush increase in density, or are burned, grazed, converted to invasive annual grass, damaged by insects and disease, encroached by conifers, or altered by various management treatments. Due to the importance of sagebrush cover for greater sage-grouse, a process to account for all of these changes in sagebrush communities is important in evaluating trends of greater sage-grouse habitat. The greater sage-grouse land use plan amendments being developed and analyzed in each sub-regional EIS in the Great Basin each have different alternative approaches to management of greater sage-grouse habitat. Alternatives propose actions that will influence the extent and distribution of sagebrush. In order to evaluate and compare the estimated effects of each alternative, a team of vegetation ecologists representing each sub-regional EIS in the Great Basin was assembled. The team used the Vegetation Dynamics Development Tool (VDDT, copyright 1995-2003, ESSA Technologies, Vancouver, BC) to accomplish this task. This modeling effort does not include changes in habitat conditions associated with permitted activities such as infrastructure development, travel management, or mineral development.

Vegetation Data

We evaluated available vegetation information developed for the Greater Sage-grouse Regional and Sub-regional efforts to identify the sagebrush habitat types and associated vegetation cover classes required in our modeling effort. We determined the most effective approach would incorporate the following criteria: 1) dataset covers the entire western region, 2) the vegetation data has an associated accuracy assessment, and 3) data provides appropriate resolution of sagebrush habitat types and associated cover classes for the VDDT models. The baseline vegetation data sets developed for the region-wide

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[2] USFS
[3] USFS

Disturbance Monitoring and Vegetation Basemap Team (**) met these criteria. The datasets were developed using Landfire v12 (updated through 2010) data products and consisted of 1) existing sagebrush base, 2) conifer base, 3) potential sagebrush base (for details on methodology see Appendix – Vegetation Basemap in Disturbance Monitoring Report). In addition, we used Landfire v12 Existing Vegetation Type to identify Invasive Annual grass and Introduced Crested Seedings. Existing Vegetation Cover was used to identify sage-grouse cover class characteristics required for the modeling effort. The above datasets were combined and clipped to BLM and USFS ownership within each Sub-regional Area (Oregon, Idaho/Montana, Utah, Nevada/California) to serve as our sagebrush modeling basemaps for subsequent analysis.

GSG Habitat Characterization for Vegetation Models

We modified the sagebrush modeling basemap to facilitate characterization of sage-grouse habitat and associated development classes identified in our models. We modified the Soil Moisture and Temperature Regime data (Chambers et al 2014, Fire and Invasives Team Report, 2014) to identify 4 Vegetation Model Types – Warm/Dry sagebrush, Mixed sagebrush, Mountain sagebrush w/conifer, and Mountain sagebrush no conifer (Table 1). In addition we identified the need for a Low Sagebrush Group. We used the Landfire v12 Biophysical Settings dataset and selected low sagebrush vegetation groups (Table 2). The resulting Model Group raster was combined (raster calculator) with the Landfire Existing Vegetation Cover data to categorize the following cover classes within the Low sage [LOW], Warm/Dry Sage[WARM/DRY], Mixed Sage[MIX], Mountain Sage w/ conifer[MTN7], and Mountain sage no conifer[MTN8] (Class A = herbaceous cover 0-100%; Class B = shrub cover 10 – 30%; Class C = shrub cover >30%).To identify Annual Grass and Crested Seeding, we assigned any Landfire Introduced Upland Vegetation -Annual Grassland (evt code 3181) or – Perennial Grassland Forbland (evt code 3182) that had a sagebrush site potential to Class Invasive Annual and Class CWG Seeding, respectively. Conifer encroachment (Class D = tree cover >10%) was determined using the Conifer base dataset subset to areas with sagebrush site potential. The resulting rasters were combined, reclassified and added back to the base Model Group raster.

Soil Moisture Temperature information was limited in some higher elevation areas or shrubland-forest transitional areas. Therefore we incorporated 30 year average annual precipitation data (PRISM ppt 30yr normal 800m2 annual) to inform any unclassified sagebrush pixels in our Model Group dataset. Specifically, we set the following criteria: Average annual precipitation 14 – 28 inches = MTN7; Average annual precipitation ≥ 28 inches = MTN8. Results were reclassified and added back to the base Model Group raster.

Additional Filters

To provide a biologically meaningful geographic extent, we filtered the final sagebrush modeling basemap to Greater sage-grouse population Areas and associated Priority Areas for Conservation (PACs) from the Conservation Objectives Team Report (USFWS, 2014). The above datasets were combined and clipped to BLM and USFS ownership within each Sub-regional Area (Oregon, Idaho/Montana, Utah, Nevada/California) to serve as our sagebrush modeling basemaps for subsequent acreage reporting and analysis.

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Miller R. F; Chambers, J. C.; Pellant, M. 2014a. A field guide to selecting the most appropriate treatments in sagebrush and pinyon-juniper ecosystems in the Great Basin: Evaluating resilience to disturbance and resistance to invasive annual grasses and predicting vegetation response. Gen. Tech. Rep. RMRS-GTR-322. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

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U.S. Fish and Wildlife Service [USFWS]. 2013. Greater sage-grouse (*Centrocercus urophasianus*) conservation objectives: Final Report. Denver, CO: U.S. Fish and Wildlife Service. 91 p.

U.S. Geological Survey (USGS). 2013: LANDFIRE 1.2.0 Existing Vegetation Type layer. Updated 3/13/2013. Washington, DC: U.S. Department of the Interior, Geological Survey. Online: http://landfire.cr.usgs.gov/viewer/. [Accessed 10 July 2014].

Table 1 – VDDT Model Groups associated with predominant sagebrush ecological types in Sage-Grouse Management Zones III, IV, V, and VI based on soil temperature and soil moisture regimes, typical characteristics, and resilience to disturbance and resistance to invasive annual grasses (modified from Chambers et al. 2014, Miller et al. 2014 a,b).

Ecological Type	Characteristics	VDDT Model
Cold and Moist (Cryic/Xeric)	Ppt: 14 inches + Typical shrubs: *Mountain big sagebrush, snowfield sagebrush, snowberry, serviceberry, silver sagebrush, and/or low sagebrushes*	MTN8, LOW
Cool and Moist (Frigid/Xeric)	Ppt: 12-22 inches Typical shrubs: *Mountain big sagebrush, antelope bitterbrush, snowberry, and/or low sagebrushes* Piñon pine and juniper potential in some areas	MTN7, LOW
Warm and Moist (Mesic/Xeric)	Ppt: 12-16 inches Typical shrubs: *Wyoming big sagebrush, mountain big sagebrush, Bonneville big sagebrush, and/or low sagebrushes* Piñon pine and juniper potential in some areas	MIX, LOW
Cool and Dry (Frigid/Aridic)	Ppt: 6-12 inches Typical shrubs: *Wyoming big sagebrush, black sagebrush, and/or low sagebrushes*	WARM/DRY, LOW
Warm and Dry (Mesic/Aridic, bordering on Xeric)	Precipitation: 8-12 inches Typical shrubs: *Wyoming big sagebrush, black sagebrush and/or low sagebrushes*	WARM/DRY, LOW

Table 2 – Landfire 120 Potential Vegetation Types identified for the Greater Sage-grouse LOW Sagebrush model.

BPS Value	Landfire Potential Vegetation Type
10640	Colorado Plateau Mixed Low Sagebrush Shrubland
10650	Columbia Plateau Scabland Shrubland
10790	Great Basin Xeric Mixed Sagebrush Steppe
11240	Columbia Plateau Low Sagebrush Steppe
11262	Inter-Mountain Basins Montane Sagebrush Steppe - Low

Datasets Used in the Vegetation Analysis
From Disturbance Monitoring and Baseline Vegetation Teams (Spring 2014)

Landfire 18 Class EVT (Current) related to sagebrush systems [dataset: lf_evt_v12_sagebrush_recode]

Landfire BPS (Potential) Associated with the 18 Class EVT above [dataset: lf_bps_v12_sagebrush_recode]

Binary Landfire 18 Class informed w Dev/Ag/Fires/Conif-sage [dataset: 2010_existing_sagebrush_base]

Binary Conifer in Sage (near neighbor analysis w/ State bio acceptance) [dataset: lf_evt_v12_conifers_binary]

Data from Fire/Invasives (FIAT) Team
SSURGO Soil Temperature/Moisture Regimes (Chambers et al 2014)

[dataset: SGMZ_SSURGO_temp_moist_regimes_v2.gdb]

Additional Spatial Data
Landfire Annual Grass Only [dataset:]

Landfire EVC (Cover) associated w/ the above Landfire Binary Sagebrush Basemap [dataset: US_120_EVC]

PRISM [dataset: PRISM_ppt_30yr_normal_800mM2_annual_bil]

Management Scale Information Filters
GSG PAC Boundaries [dataset: GSGCOT_ALL_PAC_Atts_Albers_Dis_2014]

GSG Population boundaries [dataset: COT_SG_Populations_2014_WAFWA_UT]

Subregional EIS Boundaries [dataset: EISSubmittedBoundaries_mrg_dis]

State Boundaries [dataset: States5_ESRI_2008_Albers]

Surface Mgmt Boundaries (including FS Forests/Districts; BLM District/Field Offices) [dataset: SMA_Dec2013_Monitoring_AOI_cli]

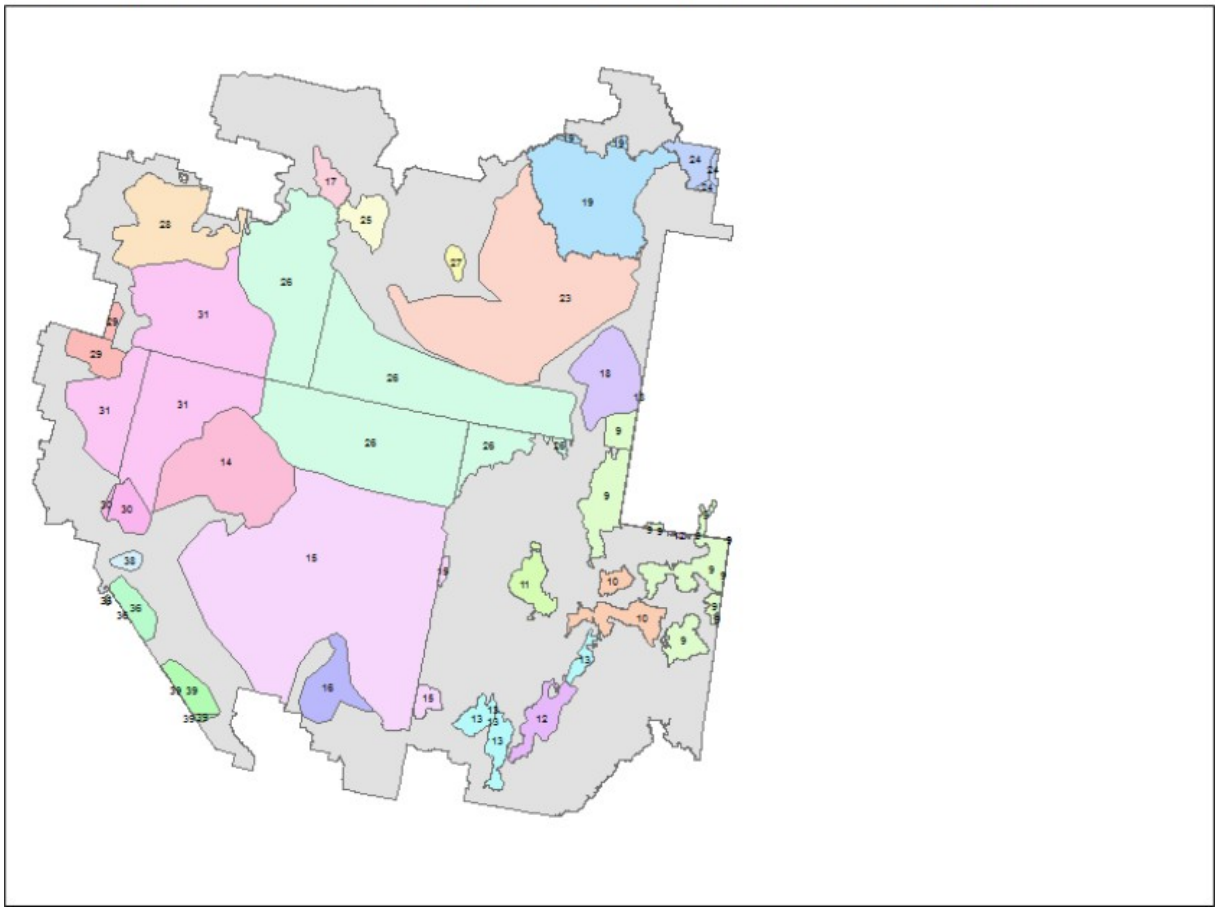
BLM – Subset: Agency: BLM, DOE, DOI, OTHFE

USFS – Subset: Agency: FS, USDA

USFS – For USFS Forest Name [dataset: USFS_GRSG_FS_Boundaries_Aug262013_Dissolved]

Utah specific to inform COT PAC and COT POP [dataset: UT_AltF_VDDT]

COT Population Unit Number - (ver. 07232014) for GSG VDDT Analysis



Appendix J

Fluid Mineral Stipulations, Waivers, Modifications, and Exceptions

APPENDIX J
FLUID MINERAL STIPULATIONS, WAIVERS, MODIFICATIONS, AND EXCEPTIONS

This appendix lists surface use stipulations for new fluid mineral (oil and gas and geothermal) leases referred to throughout the 2015 Final EIS that have been updated under the 2019 Approved RMP Amendment. In addition to fluid mineral leases, these surface use 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. Subject to valid existing rights and applicable law and policy, the stipulations would apply to uses and activities other than fluid mineral leasing. The intent is to manage other activities and uses in the same manner as fluid mineral 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 the following:

- The use of mechanized earth-moving and truck-mounted drilling equipment;
- Certain geophysical exploration activities;
- 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 geothermal and oil and gas wells;
- New road construction; and
- Use of pyrotechnics, explosives, and hazardous chemicals.

Surface-disturbing activities do not include livestock grazing, cross-country hiking, driving on designated routes, and minimum-impact filming.

DESCRIPTION OF SURFACE STIPULATIONS

Table E-1 shows the stipulations that will be carried forward or amended under the 2019 Approved RMP Amendment, including exceptions, modifications, and waivers. All stipulations for other resources, besides Greater Sage-Grouse (GRSG), included in the existing land use plans would still be applicable.

Areas identified as No Surface Occupancy (NSO) would not allow surface-disturbing activities.

Areas identified as Controlled Surface Use (CSU) would require proposed actions to be authorized in accordance with the controls or constraints specified. The controls would be applicable to all surface-disturbing activities.

Areas identified as Timing Limitation (TL) would not allow surface-disturbing activities during identified timeframes. TL areas would remain open to operations and maintenance, including associated vehicle travel, during the restricted period, unless otherwise specified in the stipulation.

RELIEF FROM STIPULATIONS

With regards to fluid minerals, surface use stipulations could have exceptions, modifications, or waivers applied with approval by the authorized officer (e.g., BLM State Director). **Table E-1** specifies the types of habitats where these stipulations would or would not apply:

Exception

An exception to stipulations associated with GRSG Habitat Management Areas (HMAs) may be granted by the authorized officer (State Director), in coordination with the appropriate state agency (NDOW, SETT, and/or CDFW), if one the following conditions are met:

i. The location of the proposed authorization is determined to be unsuitable (by a biologist with GRSG experience using methods such as Stiver et al 2015) and lacks the ecological potential to become marginal or suitable habitat; and would not result in direct, indirect, or cumulative impacts on GRSG and its habitat. Management allocation decisions would not apply to those areas determined to be unsuitable because the area lacks the ecological potential to become marginal or suitable habitat; and/or
ii. The proposed activity's impacts could be offset to result in no adverse impacts on GRSG or its habitat, through use of the mitigation hierarchy consistent with Federal law and the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations developed to implement this order). In cases where exceptions may be granted for projects with a residual impact, voluntary compensatory mitigation consistent with the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations developed to implement this order) would be one mechanism by which a proponent achieves the Approved RMP Amendment goals, objectives, and exception criteria. When a proponent volunteers compensatory mitigation as their chosen approach to address residual impacts, the BLM can incorporate those actions into the rationale used to grant an exception. The final decision to grant a waiver, exception, or modification would be based, in part, on criteria consistent with the State's GRSG management plans and policies.

Modification

The authorized officer, in coordination with the appropriate state wildlife agency (NDOW, and/or CDFW), can modify and/or waive dates for seasonal timing restrictions based on the criteria described below, based on site-specific information that indicates:

i. A project proposal's NEPA analysis and/or project record, and correspondence from NDOW and/or CDFW, demonstrates that any modification (shortening/extending seasonal timeframes or waiving the seasonal timing restrictions all together) is justified on the basis that it serves to better protect or enhance GRSG and its habitat than if the strict application of seasonal timing restrictions are implemented. Under this scenario modifications can occur if:
    a) A proposed authorization would have beneficial or neutral impacts on GRSG and its habitat.

b) Topography or other factors eliminate direct and indirect impacts from visibility and audibility to GRSG and its habitat.
c) There are documented local variations (e.g., higher/lower elevations) and/or annual climatic fluctuations (e.g., early/late spring, long/heavy winter) that indicate the seasonal life cycle periods are different than presented, or that GRSG are not using the area during a given seasonal life cycle period.

ii. Modifications are needed to address an immediate public health and safety concern in a timely manner (e.g., maintaining a road impacted by flooding).

Waiver

The stipulation may be waived if the authorized officer, in consultation with the appropriate state agency (NDOW, SETT, and/or CDFW), determines that the entire leasehold is within unsuitable habitat (see exceptions above) and would not result in direct, indirect, or cumulative impacts to GRSG and/or its habitat.

Inclusion in Environmental Analysis

The environmental analysis document prepared for site-specific proposals such as for fluid minerals (oil and gas and geothermal) development (i.e., operations plans for geothermal drilling permit or master development plans for applications for permit to drill or sundry notices) would need to address proposals to exempt, modify, or waive a surface use stipulation.

In order to exempt, modify, or waive a stipulation on BLM-administered lands, the environmental analysis would have to demonstrate that criteria from above apply; such 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 direct, indirect, or cumulative impacts.

With respect to granting relief from stipulations on other types of authorizations, such as solid mineral leases and land use authorizations, any changes to the contractual nature of these instruments would require environmental review and coordination with the lessee, permittee, or authorization holder. This would be the case when specific surface-disturbing activities are proposed via an operation plan, permitting action, or similar instrument.

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. Standard terms and conditions for fluid mineral leasing provide for relocating 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 J-1** that are within the parameters of 200 meters and 60 days are considered open to fluid mineral leasing, subject to standard terms and conditions.

Table J-1
Fluid Mineral Stipulations for Greater Sage-Grouse Habitat

Language from land use plan amendment	**Stipulation SG-01-NV-OG-NSO:** This stipulation is herein rescinded because Sagebrush Focal Areas (SFA) are not included in the 2019 Approved RMP Amendment. SFA—Managed as No Surface Occupancy (NSO), without waiver, exception, or modification, for fluid mineral leasing (oil, gas, and geothermal).
Objective	To protect GRSG habitat within the SFA
Stipulation type	Major constraint
Stipulation	NSO
Exception	
Modification	
Waiver	
Language from land use plan amendment	**Stipulation SG-02-NV-OG-NSO:** Priority Habitat Management Areas (PHMA)—Manage oil and gas resources in Nevada as NSO, with the following exceptions.
Objective	To protect GRSG in PHMA
Stipulation Type	Major constraint
Stipulation	NSO
Exception	The State Director may grant an exception to the allocations and stipulations if one of the following applies (in coordination with NDOW, SETT, and/or CDFW): i. The location of the proposed authorization is determined to be unsuitable (by a biologist with GRSG experience using methods such as Stiver et al 2015) and lacks the ecological potential to become marginal or suitable habitat; and would not result in direct, indirect, or cumulative impacts on GRSG and its habitat. Management allocation decisions would not apply to those areas determined to be unsuitable because the area lacks the ecological potential to become marginal or suitable habitat, and/or ii. The proposed activity's impacts could be offset to result in no adverse impacts on GRSG or its habitat, through use of the mitigation hierarchy consistent with Federal law and the state's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations developed to implement this order). In cases where exceptions may be granted for projects with a residual impact, voluntary compensatory mitigation consistent with the State's mitigation policies and programs, such as the State of Nevada's Executive Order 2018-32 (and any future regulations developed to implement this order) would be one mechanism by which a proponent achieves the Approved RMP Amendment goals, objectives, and exception criteria. When a proponent volunteers compensatory mitigation as their chosen approach to address residual impacts, the BLM can incorporate those actions into the rationale used to grant an exception. The final decision to grant a waiver, exception, or modification would be based, in part, on criteria consistent with the State's GRSG management plans and policies.
Modification	i. A project proposal's NEPA analysis and/or project record, and correspondence from NDOW and/or CDFW, demonstrates that any modification (shortening/extending seasonal timeframes or waiving the seasonal timing restrictions all together) is justified on the basis that it serves to better protect or enhance GRSG and its habitat than if the strict application of seasonal timing restrictions are implemented. Under this scenario modifications can occur if:

	a) A proposed authorization would have beneficial or neutral impacts on GRSG and its habitat. b) Topography or other factors eliminate direct and indirect impacts from visibility and audibility to GRSG and its habitat. c) There are documented local variations (e.g., higher/lower elevations) and/or annual climatic fluctuations (e.g., early/late spring, long/heavy winter) that indicate the seasonal life cycle periods are different than presented, or that GRSG are not using the area during a given seasonal life cycle period. ii. Modifications are needed to address an immediate public health and safety concern in a timely manner (e.g., maintaining a road impacted by flooding).
Waiver	The stipulation may be waived if the authorized officer, in consultation with the appropriate state wildlife agency (NDOW, and/or CDFW), determines that the entire leasehold is within unsuitable habitat (see exceptions above) and would not result in direct, indirect, or cumulative impacts to GRSG and/or its habitat.
Language from land use plan amendment	**Stipulation SG-02-CA-NSO:** PHMA—Manage fluid mineral resources (oil, gas, and geothermal) in California as NSO, with the following exceptions.
Objective	To protect GRSG habitat in PHMA
Stipulation Type	Major constraint
Stipulation	NSO
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-02-NV-GEOT-NSO:** PHMA—Manage Nevada geothermal resources as NSO, with the following exceptions.
Objective	To protect GRSG habitat in PHMA
Stipulation type	Major constraint
Stipulation	NSO
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	In PHMA in California only, limit the density of energy and mining facilities during project authorization to an average of one type of energy per mineral facility per 640 acres.
Objective	To protect PHMA and the life history needs of GRSG from habitat loss and GRSG populations from disturbance and limit fragmentation in PHMA. This would be implemented as a lease notice associated with new leases, in addition to the NSO stipulations. This would be applicable only to new oil and gas leases if the exception criteria identified for the NSO stipulation above were granted.
Stipulation type	Lease notice
Stipulation	Lease notice
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-03-TL:** Seasonal protection within 4.0 miles of active or pending GRSG leks in General Management Habitat Areas (GHMA)—Manage fluid mineral resources with timing limitations.
Objective	To protect GRSG lekking habitat

Stipulation Type	Timing limitation
Stipulation	NSO would be allowed within 4.0 miles of active or pending GRSG leks from March 1 through May 15.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-04-TL:** Seasonal protection of GRSG winter habitat from November 1 through February 28 in GHMA.
Objective	To protect GRSG winter habitat
Stipulation Type	Timing limitation
Stipulation	NSO would be allowed in GRSG winter habitat from November 1 through February 28.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-05-TL:** Seasonal protection of GRSG early brood-rearing habitat from May 15 through June 15 in GHMA.
Objective	To protect GRSG early brood-rearing habitat
Stipulation type	Timing Limitation
Stipulation	NSO would be allowed in GRSG early brood-rearing habitat from May 15 through June15.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-06-TL:** Seasonal protection of GRSG late brood-rearing habitat from June 15 through September 15 in GHMA.
Objective	To protect GRSG late brood-rearing habitat
Stipulation type	Timing Limitation
Stipulation	NSO would be allowed in GRSG late brood-rearing habitat from June 15 through September 15.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-08-CSU:** Authorizations/permits would limit noise from discretionary activities (during construction, operation, or maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and/or pending leks from 2 hours before to 2 hours after sunrise and sunset during the breeding season from March 1 through May 15.
Objective	To protect GRSG lek sites
Stipulation type	Controlled Surface Use (CSU)
Stipulation	Authorizations/permits would limit noise from discretionary activities (during construction, operation, or maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks from 2 hours before to 2 hours after sunrise and sunset during the breeding season from March 1 through May 15.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**

Language from Land Use Plan Amendment	**Stipulation SG-9-CSU:** In all GRSG HMAs, the BLM would apply lek buffer distances, as recommended in the United States Geological Service Report Conservation Buffer Distance estimates for Greater Sage Grouse—A Review Open File- Report 2014-1239 (Manier et al. 2014; see Appendix B).
Objective	To protect GRSG seasonal habitats
Stipulation type	CSU
Stipulation	The BLM, through project specific NEPA analysis, would assess and address impacts from the following activities using the lower end of the interpreted range of lek buffer-distances and guidance identified in the USGS Report, *"Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review",* Open File Report 2014-1239 (Mainer et al. 2014). Project specific analysis should use the lower end of the interpreted range in the report as a guideline for effects determination unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek[1] buffer-distances is as follows: • linear features (roads) within 3.1 miles of leks; • infrastructure related to energy development within 3.1 miles of leks; • tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks; • low structures (e.g., fences, rangeland structures) within 1.2 miles of leks in flat or rolling terrain; • surface disturbance (continuing human activities that alter or remove the natural vegetation, excluding livestock grazing) within 3.1 miles of leks; and • noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.
Exception	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Modification	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Waiver	Same as described above in **Stipulation SG-02-NV-OG-NSO**
Language from land use plan amendment	**Stipulation SG-NV-10-CSU:** New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority, such as required by the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).
Objective	To achieve a net conservation gain at the project level, as a component of compliance with a state mitigation plan, program, or authority, such as required by the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).
Stipulation type	CSU
Stipulation	New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority, such as required by the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).
Exception	New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority, such as required by the State of Nevada's Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).

[1] Applicable to Active and Pending leks as defined by NDOW and CDFW

Modification	None
Waiver	None
Language from land use plan amendment	**Stipulation SG-CA-11-CSU:** New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority.
Objective	To achieve a net conservation gain at the project level, as a component of compliance with a state mitigation plan, program, or authority
Stipulation type	CSU
Stipulation	New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority.
Exception	New development/activity would not exceed the 3% disturbance cap protocol at the project scale in PHMA, except in situations where a net conservation gain to the species is achieved as a component of compliance with a state mitigation plan, program, or authority.
Modification	None
Waiver	None

Appendix K

Disturbance Cap Guidance

APPENDIX K
DISTURBANCE CAP GUIDANCE

GREATER SAGE-GROUSE (GRSG) DISTURBANCE CAPS

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010. The 18 threats have been aggregated into three measures:

- Sagebrush Availability (percent of sagebrush per unit area)
- Habitat Degradation (percent of human activity per unit area)
- Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

Disturbance Cap for Northeastern California

For lands in California, this land use plan has incorporated a 3% disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

> *If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG Priority Habitat Management Areas (PHMA)in any given Biologically Significant Unit (BSU), then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within GRSG PHMAs in any given BSU until the disturbance has been reduced to less than the cap.*
>
> *If the 3% disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area in a PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.).*

Disturbance Cap for Nevada

In Nevada, this Approved RMP Amendment has incorporated a 3% disturbance management protocol for lands within the State of Nevada for Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs), except in situations where a net conservation gain to the species can be achieved, as a component of compliance with a state mitigation plan, program, or authority, such as required by State of Nevada Executive Order 2018-32 (and any future regulations adopted by the State of Nevada regarding compensatory mitigation, consistent with federal law).

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (**Table E-1**) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1]) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

- For the Project Analysis Area:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2]) ÷ (acres of all lands within the PHMA in the project analysis area) x 100.

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

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

Project Analysis Area Method for Permitting Surface Disturbance Activities

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in **Table K-1** and the 7 additional features that are considered threats to sage-grouse (**Table K-2**). Using 1 meter resolution NAIP imagery is recommended. Use existing local data if available.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3%, proceed to next step. If existing disturbance is greater than 3%, defer the project in California, and apply the disturbance management protocol in Nevada.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3%, proceed to next step. If disturbance is greater than 3%, defer project in California, and apply the disturbance management protocol in Nevada.
- For BLM-administered lands in Northeastern California, calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

DENSITY CAP FOR NORTHEASTERN CALIFORNIA

For BLM land in the state of California only, this land use plan has also incorporated a cap on the density of energy and mining facilities at an average of 1 facility per 640 acres in PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than 1 facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of 1 facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.). Facilities included in the density calculation (**Table K-3**) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Table K-1
Anthropogenic Disturbance Types for Disturbance Calculations
Data Sources are Described for the West-Wide Habitat Degradation Estimates

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table K-2
The Seven Site Scale Features Considered Threats to Sage-Grouse Included in the Disturbance Calculation for Project Authorizations

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure
Definitions:
1. Coalbed Methane and other Energy-related Retention Ponds – The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.
2. Meteorological Towers – This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.
3. Nuclear Energy Facilities – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
4. Airport Facilities and Infrastructure (public and private) – The footprint boundary will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.
5. Military Range Facilities & Infrastructure – The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.
6. Hydroelectric Plants – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.
7. Recreation Areas & Facilities – This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

Table K-3
Relationship Between the 18 Threats and the Three Habitat Disturbance Measures for Monitoring and Disturbance Calculations

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

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Appendix L
Noise Protocol

APPENDIX L
NOISE PROTOCOL

The following recommendations are intended to serve as a general protocol for collection of noise measurements in areas of existing and proposed development. The intent is to provide guidelines to experienced personnel so that measurements are made in a consistent and accurate manner and to highlight areas where specialized training and equipment is required. The goal is to develop a protocol that is efficient, effective, and produces consistent results. The protocol was written to facilitate the gathering of noise measurements relevant to stipulations for GRSG protection. Use of a standard protocol for noise monitoring will ensure that future measurements are comparable across locations, times, and surveyors. This protocol should be considered a work in progress and should be updated, in coordination with appropriate entities as data needs and availability change (Blickley and Patricelli 2013).

SUMMARY OF NOISE-MONITORING RECOMMENDATIONS

- Measurements should be made by qualified personnel experienced in acoustical monitoring.
- Measurements should be made with a high quality, calibrated Type I (noise floor < 25 dB) sound level meter (SLM) with a microphone windscreen and (where applicable) environmental housing.
- Measurements should be collected during times when noise exposure is most likely to affect greater sage-grouse— nights and mornings (i.e. 6 pm – 9 am) and should be taken for ≥1 hour at each site, ideally over multiple days with suitable climactic conditions. To capture typical variability in noise level at the site of interest, deployment of SLM units for multiple days is preferred.
- Environmental conditions should be measured throughout noise measurement periods so that measurements made during unsuitable conditions can be excluded.
- Measurements should be made at multiple (3-4) locations between each noise source and the edge of the protected area. On-lek measurements should exclude time periods when birds are lekking.
- Accurate location data should be collected for each measurement location. Surveyors also should catalog the type and location of all nearby sources of anthropogenic noise.

- Critical metrics should be collected: L50, L90, L10, Leq, and Lmax. All measurements should be collected in A-weighted decibels (dBA) and, if possible, also collected in unweighted (dBF) and C-weighted (dBC) decibels. If possible, SLM should log 1/3-octave band levels throughout the measurement period. Additional metrics may be collected, depending on the goals of the study.
- Due to the difficulty of measuring ambient noise levels in quiet conditions, we recommend the use of both empirical sampling and ambient noise modeling to establish baseline ambient values.

REFERENCES

See the following studies for complete protocols and methods:

Blickley, J. L, and G. L. Patricelli. 2013. Noise monitoring recommendations for Greater Sage-Grouse habitat in Wyoming. Prepared for the PAPA, Pinedale, WY.

Ambrose, S., and C. Florian. 2013. Sound Levels of Gas Field Activities at Greater Sage-Grouse Leks, Pinedale Anticline Project Area, Wyoming. Prepared for Wyoming Game and Fish Department Cheyenne, WY.

Appendix M

Monitoring Framework

THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

Bureau of Land Management
U.S. Forest Service

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

May 30, 2014

The Greater Sage-Grouse Monitoring Framework

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

INTRODUCTION

The purpose of this U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) Greater Sage-Grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM's national planning strategy (attachment to BLM Instruction Memorandum 2012-044), the BLM resource management plans (RMPs), and the USFS's land management plans (LMPs) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) and the USFS (36 CFR part 209, published July 1, 2010) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations based on the sensitivity of the resource to the decisions involved. Therefore, the BLM and the USFS will use the methods described herein to collect monitoring data and to evaluate implementation and effectiveness of the Greater Sage-Grouse (GRSG) (hereafter, sage-grouse) planning strategy and the conservation measures contained in their respective land use plans (LUPs). A monitoring plan specific to the Environmental Impact Statement, land use plan, or field office will be developed after the Record of Decision is signed. For a summary of the frequency of reporting, see Attachment A, An Overview of Monitoring Commitments. Adaptive management will be informed by data collected at any and all scales.

To ensure that the BLM and the USFS are able to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology—at multiple scales—for monitoring of implementation and disturbance and for evaluating the effectiveness of BLM and USFS actions to conserve the species and its habitat. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will allow the BLM and the USFS to evaluate the extent that decisions from their LUPs to conserve sage-grouse and their habitat have been implemented. State fish and wildlife agencies will collect population monitoring information, which will be incorporated into effectiveness monitoring as it is made available.

This multiscale monitoring approach is necessary, as sage-grouse are a landscape species and conservation is scale-dependent to the extent that conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and were applied specifically to the scales of sage-grouse habitat selection by Stiver et al. (*in press)* as first order (broad scale), second order (mid scale), third order (fine scale), and fourth order (site scale). Habitat selection and habitat use by sage-grouse occur at multiple scales and are driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat use by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits managers' ability to identify the threats to sage-grouse

and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see "Sage-Grouse Habitat Assessment Framework: Multiscale Habitat Assessment Tool" (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Rangewide, best available datasets for broad- and mid-scale monitoring will be acquired. If these existing datasets are not readily available or are inadequate, but they are necessary to inform the indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions, the BLM and the USFS will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine- and site-scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries, and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004). (See Figure 1, Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.) This broad- and mid-scale monitoring data and analysis will provide context for RMP/LMP areas; states; GRSG Priority Habitat, General Habitat, and other sage-grouse designated management areas; and Priority Areas for Conservation (PACs), as defined in "Greater Sage-grouse *(Centrocercus urophasianus)* Conservation Objectives: Final Report" (Conservation Objectives Team [COT] 2013). Hereafter, all of these areas will be referred to as "sage-grouse areas."

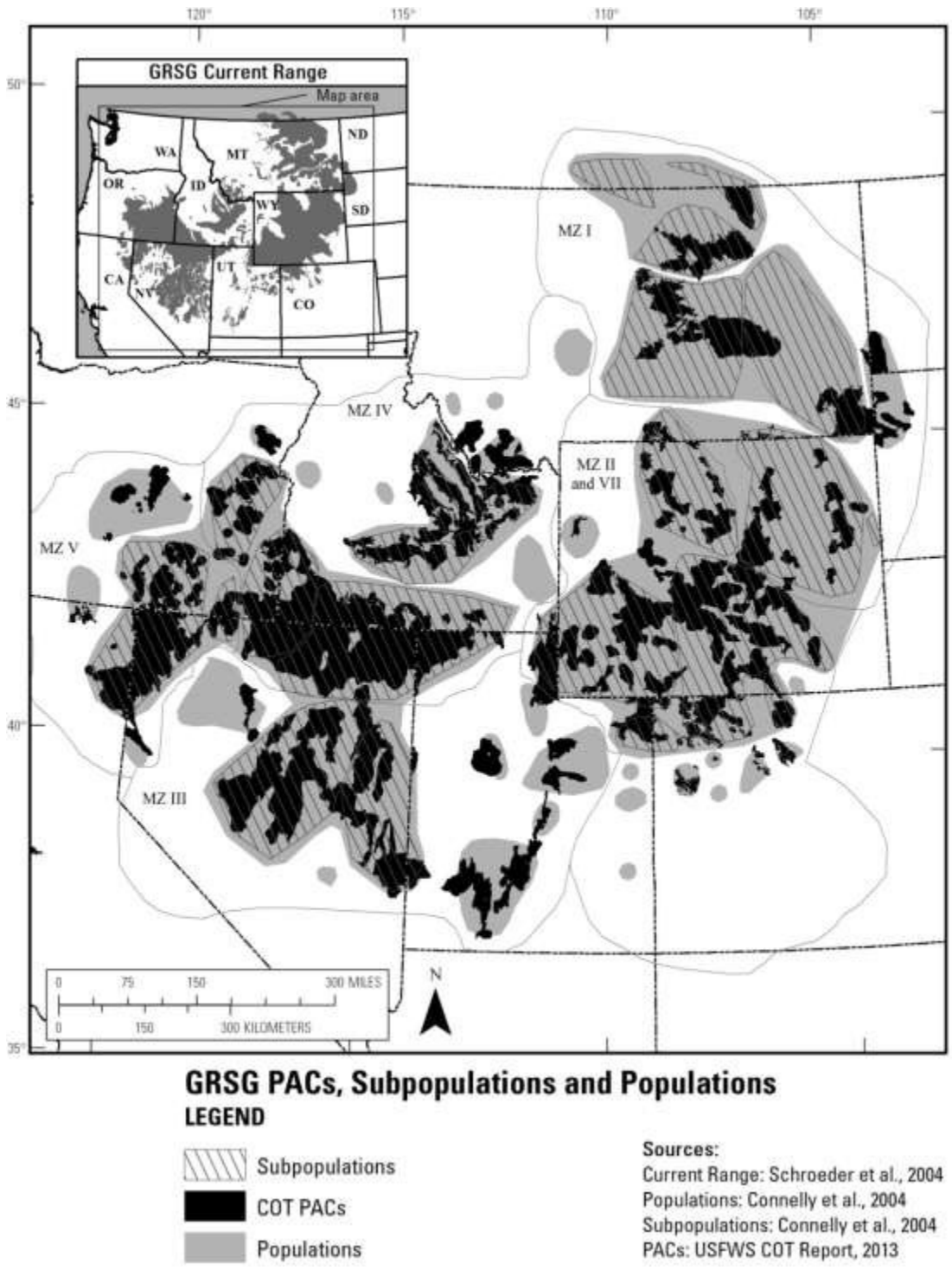

Figure 1. Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.

This monitoring framework is divided into two sections. The broad- and mid-scale methods , described in Section I, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of the planning strategy and management decisions. (See Table 1, Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.) For sage-grouse habitat at the fine and site scales, described in Section II, this monitoring framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding , support, and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of BLM and USFS multiscale monitoring commitments , see Attachment A.

Table 1. Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions , sage-grouse habitat , and sage-grouse populations at the broad and mid scales.

	Implementation	Habitat		Population (State Wildlife Agencies)
Geographic Scales		Availability	Degradation	Demographics
Broad Scale: From the range of sage-grouse to WAFWA Management Zones	BLM/USFS National planning strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mmmg, and infrastructure facilities	WAFWA Management Zone population trend
Mid Scale: From WAFWA Management Zone to populations; PACs	RMP/LMP decisions	Mid-scale habitat indicators (HAF; Table 2 herein, e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mmmg, and infrastructure facilities (Table 2 herein)	Individual population trend

I. BROAD AND MID SCALES

First-order habitat selection, the broad scale, describes the physical or geographical range of a species. The first-order habitat of the sage-grouse is defined by populations of sage-grouse associated with sagebrush landscapes, based on Schroeder et al. 2004, and Connelly et al. 2004, and on population or habitat surveys since 2004. An intermediate scale between the broad and mid scales was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-Grouse Management Zones (MZs). Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second-order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi^2 and are nested within MZs. PACs range from 20 to 20,400 mi^2 and are nested within population areas.

Other mid-scale landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

A. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of RMP/LMP decisions. The BLM and the USFS will monitor implementation of project-level and/or site-specific actions and authorizations, with their associated conditions of approval/stipulations for sage-grouse, spatially (as appropriate) within Priority Habitat, General Habitat, and other sage-grouse designated management areas, at a minimum, for the planning area. These actions and authorizations, as well as progress toward completing and implementing activity-level plans, will be monitored consistently across all planning units and will be reported to BLM and USFS headquarters annually, with a summary report every 5 years, for the planning area. A national-level GRSG Land Use Plan Decision Monitoring and Reporting Tool is being developed to describe how the BLM and the USFS will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the Record of Decision or approved plan. The BLM and the USFS will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B. Habitat Monitoring

The U.S. Fish and Wildlife Service (USFWS), in its 2010 listing decision for the sage-grouse, identified 18 threats contributing to the destruction, modification, or curtailment of sage-grouse habitat or range (75 FR 13910 2010). The BLM and the USFS will, therefore, monitor the relative extent of these threats that remove sagebrush, both spatially and temporally, on all lands within an analysis area, and will report on amount, pattern, and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad- and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. (See Table 2, Relationship between the 18 threats and the three habitat disturbance measures for monitoring.) The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)

Measure 2: Habitat Degradation (percent of human activity per unit area)

Measure 3: Energy and Mining Density (facilities and locations per unit area)

These three habitat disturbance measures will evaluate disturbance on all lands, regardless of land ownership. The direct area of influence will be assessed with the goal of accounting for actual removal of sagebrush on which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 (sagebrush availability) examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape). Measure 1, therefore, monitors the change in sagebrush availability—or, specifically, where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability of supporting sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see Section I.B.1., Sagebrush Availability). Measure 2 (see Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (see Section I.B.3., Energy and Mining Density) focus on where habitat degradation is occurring by using the footprint/area of direct disturbance and the number of facilities at the mid scale to identify the relative amount of degradation per geographic area of interest and in areas that have the capability of supporting sagebrush and seasonal sage-grouse use. Measure 2 (habitat degradation) not only quantifies footprint/area of direct disturbance but also establishes a surrogate for those threats most likely to have ongoing activity. Because energy development and mining activities are typically the most intensive activities in sagebrush habitat, Measure 3 (the density of active energy development, production, and mining sites) will help identify areas of particular concern for such factors as noise, dust, traffic, etc. that degrade sage-grouse habitat.

Table 2. Relationship between the 18 threats and the three habitat disturbance measures for monitoring.

Note: Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

The methods to monitor disturbance found herein differ slightly from methods used in Manier et al. 2013, which provided a baseline environmental report (BER) of datasets of disturbance across jurisdictions. One difference is that, for some threats, the BER data were for federal lands only. In addition, threats were assessed individually, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to use the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate each of the three habitat disturbance measures.

B.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. Measure 1 has been divided into two submeasures to describe sagebrush availability on the landscape:

> Measure 1a: the current amount of sagebrush on the geographic area of interest, and
>
> Measure 1b: the amount of sagebrush on the geographic area of interest compared with the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic area of interest]. The appropriate geographic areas of interest for sagebrush availability include the species' range, WAFWA MZs, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the geographic area of interest) will be calculated using this formula: [existing sagebrush divided by [pre-EuroAmerican settlement geographic extent of lands that could have supported sagebrush]. This measure will provide information to set the context for a given geographic area of interest during evaluations of monitoring data. The information could also be used to inform management options for restoration or mitigation and to inform effectiveness monitoring.

The sagebrush base layer for Measure 1 will be based on geospatial vegetation data adjusted for the threats listed in Table 2. The following subsections of this monitoring framework describe the methodology for determining both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid scales.

a. Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the rangewide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2013). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the rangewide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability of supporting sagebrush vegetation pre-EuroAmerican settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area of interest compared with how much sagebrush existed historically (Measure 1b). Therefore, the BLM and the USFS have determined that LANDFIRE provides the best available data at broad and mid scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. The BLM and the USFS, in addition to aggregating the sagebrush types into the sagebrush base layer, will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. The BLM—through its Assessment, Inventory, and Monitoring (AIM) program and, specifically, the BLM's landscape monitoring framework (Taylor et al. 2014)—will provide field data to the LANDFIRE program to support continuous quality improvements of the LANDFIRE EVT layer. The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of the existing percent of sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will also be used to determine the trend in other landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (See Section I.D., Effectiveness Monitoring).

Within the USFS and the BLM, forest-wide and field office–wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than what is provided through LANDFIRE. Where available, these finer-scale products will be useful for additional and complementary mid-scale indicators and local-scale analyses (see Section II,

Fine and Site Scales). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid scale, where consistency of data products is necessary across broader geographies.

Data Sources for Establishing and Monitoring Sagebrush Availability

There were three criteria for selecting the datasets for establishing and monitoring the change in sagebrush availability (Measure 1):

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Continual maintenance of dataset and known update interval

Datasets meeting these criteria are listed in Table 3, Datasets for establishing and monitoring changes in sagebrush availability.

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping there have been two update efforts: version 1.1 represents changes before 2008, and version 1.2 reflects changes on the landscape before 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Sage-grouse subject matter experts determined which of the ecological systems from the LANDFIRE EVT to use in the sagebrush base layer by identifying the ecological systems that have the capability of supporting sagebrush vegetation and that could provide suitable seasonal habitat for the sage-grouse. (See Table 4, Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.) Two additional vegetation types that are not ecological systems were added to the EVT: *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE BpS. In LANDFIRE EVT, however, in some map zones, the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance, respectively.

Table 3. Datasets for establishing and monitoring changes in sagebrush availability.

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting v1.1	LANDFIRE	Static	2008	Denominator for sagebrush availability
Existing Vegetation Type v1.2	LANDFIRE	Static	2010	Numerator for sagebrush availability
Cropland Data Layer	National Agricultural Statistics Service	Annual	2012	Agricultural updates; removes existing sagebrush from numerator of sagebrush availability
National Land Cover Dataset Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5-Year	2011 (next available in 2016)	Urban area updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity	Annual	2012 (2-year delay in data availability)	> 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

Table 4. Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.

Ecological System	Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Mixed Low Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longiloba* *Artemisia bigelovii* *Artemisia nova* *Artemisia frigida* *Artemisia tridentata* ssp. *wyomingensis*
Columbia Plateau Low Sagebrush Steppe	*Artemisia arbuscula* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova*

Columbia Plateau Scabland Shrubland	*Artemisia rigida*
Columbia Plateau Steppe and Grassland	*Artemisia* spp.
Great Basin Xeric Mixed Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longicaulis* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Shrubland	*Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Steppe	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *tripartita* *Artemisia frigida*
Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland	*Artemisia tridentata* ssp. *vaseyana* *Artemisia arbuscula* *Artemisia tridentata*
Inter-Mountain Basins Mixed Salt Desert Scrub	*Artemisia tridentata* ssp. *wyomingensis* *Artemisia spinescens*
Inter-Mountain Basins Montane Sagebrush Steppe	*Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia nova* *Artemisia arbuscula* *Artemisia tridentata* ssp. *spiciformis*
Inter-Mountain Basins Semi-Desert Shrub-Steppe	*Artemisia tridentata* *Artemisia bigelovii* *Artemisia tridentata* ssp. *wyomingensis*
Northwestern Great Plains Mixed Grass Prairie	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *vaseyana* *Artemisia frigida*
Northwestern Great Plains Shrubland	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis*
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	*Artemisia tridentata*
Rocky Mountain Lower Montane-Foothill Shrubland	*Artemisia nova* *Artemisia tridentata* *Artemisia frigida*
Western Great Plains Floodplain Systems	*Artemisia cana* ssp. *cana*
Western Great Plains Sand Prairie	*Artemisia cana* ssp. *cana*
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	*Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *rupicola*
Artemisia tridentata ssp. *vaseyana* Shrubland Alliance (EVT only)	*Artemisia tridentata* ssp. *vaseyana*
Quercus gambelii Shrubland Alliance (EVT only)	*Artemisia tridentata*

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table 4 will be merged into one value that represents the sagebrush base layer. With all ecological systems aggregated, the combined accuracy of the sagebrush base layer (EVT) will be much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of its EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historical range of sage-grouse as defined by Schroeder (2004). (See Attachment B, User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones.) The aggregated sagebrush base layer for monitoring had user accuracies ranging from 57.1% to 85.7% and producer accuracies ranging from 56.7% to 100%.

LANDFIRE EVT data are not designed to be used at a local level. In reports of the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the 30m pixel level (900m^2 resolution of raster data) for any reporting. The smallest geographic extent for using the data to determine percent sagebrush is at the PAC level; for the smallest PACs, the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (http://www.nass.usda.gov/research/Cropland/Release/index.htm). CDL data are generated annually, with estimated producer accuracies for "large area row crops ranging from the mid 80% to mid-90%," depending on the state (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Specific information on accuracy may be found on the NASS metadata website (http://www.nass.usda.gov/research/Cropland/metadata/meta.htm). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes and nonagricultural classes. For this effort, and in the baseline environmental report (Manier et al. 2013), nonagricultural classes were removed from the original dataset. The excluded classes are:

> Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open

Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands (and for updating the base layer for agricultural lands in the future) is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of the CDL classifies that pixel as one of the nonagricultural classes listed above. The assumption is that even though individual pixels may be classified as a nonagricultural class in any given year, the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table 4. A further assumption is that once an area has moved into agricultural use, it is unlikely that the area would be restored to sagebrush. Should that occur, however, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the sagebrush restoration monitoring section of this monitoring framework (see Section I.B.1.b., Monitoring Sagebrush Availability).

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Database (NLCD) (Fry et al. 2011) includes a percent imperviousness dataset that was selected as the best available dataset to be used for urban adjustments and monitoring. These data are generated on a 5-year cycle and are specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel in NLCD will be removed from the sagebrush base layer through the monitoring process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, this is acceptable for the adjustment and monitoring for two reasons. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones. This is because unincorporated urban areas were not being included, thus leaving large chunks of urban pixels unaccounted for in this rule set. Second, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, all impervious pixels will be used.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire adjustments and updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires that all fires of more than 10 acres are to be reported to GeoMac; therefore, there will be many small fires of less than 10 acres that will not be accounted for in the adjustment and monitoring attributable to fire. Using fire perimeters from GeoMac, all sagebrush pixels falling

within the perimeter of fires less than 1,000 acres will be used to adjust and monitor the sagebrush base layer.

For fires greater than 1,000 acres, MTBS was selected as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (http://www.mtbs.gov) is an ongoing, multiyear project to map fire severity and fire perimeters consistently across the United States. One of the burn severity classes within MTBS is an unburned to low-severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter for the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. Not all wildfires, however, have the same impacts on the recovery of sagebrush habitat, depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed, restoration than does the warmer, dryer sagebrush habitat. These cooler, moister areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment Adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation resulting in sage-grouse habitat loss include various juniper species, such as Utah juniper *(Juniperus osteosperma),* western juniper *(Juniperus occidentalis),* Rocky Mountain juniper *(Juniperus scopulorum),* pinyon species, including singleleaf pinyon *(Pinus monophylla)* and pinyon pine *(Pinus edulis),* ponderosa pine *(Pinus ponderosa),* lodgepole pine *(Pinus contorta),* and Douglas fir *(Pseudotsuga menziesii)* (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to adjust the sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they had the capability of supporting both the conifer species (listed above) and sagebrush vegetation. Those ecological systems were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. (See Table 5, Ecological systems with conifers most likely to encroach into sagebrush vegetation.) Sagebrush vegetation was defined as including sagebrush species or subspecies that provide habitat for the Greater Sage-Grouse and that are included in the HAF. (See Attachment C, Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers.) An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems, and these pixels were removed from the sagebrush base layer.

Table 5. Ecological systems with conifers most likely to encroach into sagebrush vegetation.

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus osteosperma* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia bigelovii* *Artemisia pygmaea*
Columbia Plateau Western Juniper Woodland and Savanna	*Juniperus occidentalis* *Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia rigida* *Artemisia tridentata* ssp. *vaseyana*
East Cascades Oak-Ponderosa Pine Forest and Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Artemisia tridentata* *Artemisia nova*
Great Basin Pinyon-Juniper Woodland	*Pinus monophylla* *Juniperus osteosperma* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* *Artemisia tridentata* ssp. *vaseyana*
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*
Rocky Mountain Foothill Limber Pine-Juniper Woodland	*Juniperus osteosperma* *Juniperus scopulorum* *Artemisia nova* *Artemisia tridentata*
Rocky Mountain Poor-Site Lodgepole Pine Forest	*Pinus contorta* *Pseudotsuga menziesii* *Pinus ponderosa* *Artemisia tridentata*
Southern Rocky Mountain Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus monosperma* *Artemisia bigelovii* *Artemisia tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana*
Southern Rocky Mountain Ponderosa Pine Woodland	*Pinus ponderosa* *Pseudotsuga menziesii*

Pinus edulis *Pinus contorta* *Juniperus* spp. *Artemisia nova* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to the present (beyond the LANDFIRE data) that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see Section I.B.1.b., Monitoring Sagebrush Availability.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to the present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated); therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (version 1.2) attributable to restoration activities since 2010. Successful restoration treatments before 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Monitoring Sagebrush Availability

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

> ***2010 Existing Sagebrush Base Layer*** = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires that are less than 1,000 acres] minus [2009/10 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] minus [Conifer Encroachment Layer]
>
> ***2012 Existing Sagebrush Update*** = [2010 Existing Sagebrush Base Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]
>
> ***Monitoring Existing Sagebrush post 2012*** = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years of MTBS Fires that are greater than

1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field]

Monitoring Sagebrush Restoration

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper are examples of updates to the sagebrush base layer that can add sagebrush vegetation back into sagebrush availability in the landscape. When restoration has been determined to be successful through rangewide, consistent, interagency fine- and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad- and mid-scale sagebrush base layer.

Measure 1b: Context for Monitoring the Amount of Sagebrush in a Geographic Area of Interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre-EuroAmerican settlement (v1.2 of LANDFIRE).

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre-EuroAmerican settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units that are based on NatureServe (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that are capable of supporting sagebrush vegetation and of providing seasonal habitat for sage-grouse (Table 4). Ecological systems selected included sagebrush species or subspecies that are included in the HAF and listed in Attachment C.

The BpS layer does not have an associated accuracy assessment, given the lack of any reference data. Visual inspection of the BpS data, however, reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies is that the rule sets used to map a given ecological system will vary among map zones based on different physical, biological, disturbance, and atmospheric regimes of the region. These variances can result in artificial edges in the map. Metrics will be calculated, however, at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels. Therefore, the magnitude of these observable errors in the BpS layer will be minor compared with the size of the reporting units. Since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will have only a minor impact on the percent sagebrush availability calculation. *As with the LANDFIRE EVT, LANDFIRE BpS data are not designed to be used at a local level*. LANDFIRE data should never be used at the 30m pixel level for reporting.

In conclusion, sagebrush availability data will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year, and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to wildfire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meet the criteria for adding sagebrush areas back into the sagebrush base layer will be factored in as data allow. Given data availability, there will be a 2-year lag (approximately) between when the estimate is generated and when the data used for the estimate become available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through the BLM's EGIS web portal and geospatial gateway or through the authoritative data source. Legacy datasets will be preserved so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to help users understand the limitation of the sagebrush estimates; it will be summarized spatially by map zone and will be included in the portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to improve the overall quality of data products greatly, primarily through the use of higher-quality remote sensing datasets. Additionally, the BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad- and mid-scale analyses through the Grass/Shrub mapping effort. The Grass/Shrub mapping effort applies the Wyoming multiscale sagebrush habitat methodology (Homer et al. 2009) to depict spatially the fractional percent cover estimates for five components rangewide and West-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. A benefit of the design of these fractional cover maps is that they facilitate monitoring "within" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "within" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub mapping effort is not a substitute for fine-scale monitoring but will leverage fine-scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. At the earliest, this evaluation will occur in 2018 or 2019, depending on data availability.

B.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table 2. The footprint is defined as the direct area of influence of "active" energy and infrastructure; it is used as a surrogate for human activity. Although these analyses will try to summarize results at the aforementioned meaningful geographic areas of interest, some may be too small to report the metrics appropriately and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table 6, Geospatial data sources for habitat degradation. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be provided to the USFWS.

a. Habitat Degradation Datasets and Assumptions

Energy (oil and gas wells and development facilities)

This dataset will compile information from three oil and gas databases: the proprietary IHS Enerdeq database, the BLM Automated Fluid Minerals Support System (AFMSS) database, and the proprietary Platts (a McGraw-Hill Financial Company) GIS Custom Data (hereafter, Platts) database of power plants. Point data from wells active within the last 10 years from IHS and producing wells from AFMSS will be considered as a 5-acre (2.0ha) direct area of influence centered on the well point, as recommended by the BLM WO-300 (Minerals and Realty Management). Plugged and abandoned wells will be removed if the date of well abandonment was before the first day of the reporting year (i.e., for the 2015 reporting year, a well must have been plugged and abandoned by 12/31/2014 to be removed). Platts oil and gas power plants data (subset to operational power plants) will also be included as a 5-acre (2.0ha) direct area of influence.

> ***Additional Measure: Reclaimed Energy-related Degradation.*** This dataset will include those wells that have been plugged and abandoned. This measure thereby attempts to measure energy-related degradation that has been reclaimed but not necessarily fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last 10 years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed 2–10 years from energy development activities (Harju et al. 2010). Reclamation actions may require 2 or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take 6 or more years from the point of seeding, depending on such variables as annual precipitation, annual temperature, and soil type and depth (Pyke 2011). This 10-year period is conservative and assumes some level of habitat improvement 10 years after plugging. Research by Hemstrom et al. (2002), however,

proposes an even longer period—more than 100 years—for recovery of sagebrush habitats, even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication, February 12, 2014). This additional layer/measure could be used at the broad and mid scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded. This layer/measure could also be used where further investigation at the fine or site scale would be warranted to: 1) quantify the level of reclamation already conducted, and 2) evaluate the amount of restoration still required for sagebrush habitat recovery. At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to wildfire and agriculture conversion (see Monitoring Sagebrush Restoration in Section I.B.1.b., Monitoring Sagebrush Availability). This dataset will be updated annually from the IHS dataset.

Energy (coal mines)

Currently, there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement coal mining permit polygons (as available), and U.S. Geological Survey (USGS) Mineral Resources Data System mine occurrence points. These data will inform where active coal mining may be occurring. Additionally, coal power plant data from Platts power plants database (subset to operational power plants) will be included. Aerial imagery will then be used to digitize manually the active coal mining and coal power plants surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine and power plant direct area of influence. Coal mine location data source and imagery date will be documented for each digitized coal polygon at the time of creation. Subsurface facility locations (polygon or point location as available) will also be collected if available, included in density calculations, and added to the active surface activity layer as appropriate (if an actual direct area of influence can be located).

Energy (wind energy facilities)

This dataset will be a subset of the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be included. Direct area of influence of these point features will be measured by converting to a polygon dataset as a direct area of

influence of 3 acres (1.2ha) centered on each tower point. See the BLM's "Wind Energy Development Programmatic Environmental Impact Statement" (BLM 2005). Additionally, Platts power plants database will be used for transformer stations associated with wind energy sites (subset to operational power plants), also with a 3-acre (1.2ha) direct area of influence.

Energy (solar energy facilities)

This dataset will include solar plants as compiled with the Platts power plants database (subset to operational power plants). This database includes an attribute that indicates the operational capacity of each solar power plant. Total capacity at the power plant was based on ratings of the in-service unit(s), in megawatts. Direct area of influence polygons will be centered over each point feature representing 7.3ac (3.0ha) per megawatt of the stated operational capacity, per the report of the National Renewable Energy Laboratory (NREL), "Land-Use Requirements for Solar Power Plants in the United States" (Ong et al. 2013).

Energy (geothermal energy facilities)

This dataset will include geothermal wells in existence or under construction as compiled with the IHS wells database and power plants as compiled with the Platts database (subset to operational power plants). Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2ha) centered on each well or power plant point.

Mining (active developments; locatable, leasable, saleable)

This dataset will include active locatable mining locations as compiled with the proprietary InfoMine database. Aerial imagery will then be used to digitize manually the active mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active mine direct area of influence. Mine location data source and imagery date will be documented for each digitized polygon at the time of creation. Currently, there are no known compressive databases available for leasable or saleable mining sites beyond coal mines. Other data sources will be evaluated and used as they are identified or as they become available. Point data may be converted to polygons to represent direct area of influence unless actual surface disturbance is available.

Infrastructure (roads)

This dataset will be compiled from the proprietary Esri StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstate Highways, Major Roads, and Surface Streets to capture most paved and "crowned and ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in the broad- and mid-scale monitoring, may support a volume of traffic that can have deleterious effects on sage-grouse leks. It may be

appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine- and site-scale analysis will require more site-specific data than is identified in this monitoring framework. The direct area of influence for roads will be represented by 240.2ft, 84.0ft, and 40.7ft (73.2m, 25.6m, and 12.4m) total widths centered on the line feature for Interstate Highways, Major Roads, and Surface Streets, respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: This is a related but different dataset than what was used in BER (Manier et al. 2013). Individual BLM/USFS planning units may use different road layers for fine- and site-scale monitoring.*

Infrastructure (railroads)

This dataset will be a compilation from the Federal Railroad Administration Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct are of influence for railroads will be represented by a 30.8ft (9.4m) total width (Knick et al. 2011) centered on the non-abandoned railroad line feature.

Infrastructure (power lines)

This line dataset will be derived from the proprietary Platts transmission lines database. Linear features in the dataset attributed as "buried" will be removed from the disturbance calculation. Only "In Service" lines will be used; "Proposed" lines will not be used. Direct area of influence will be determined by the kV designation: 1–199 kV (100ft/30.5m), 200–399 kV (150ft/45.7m), 400–699 kV (200ft/61.0m), and 700-or greater kV (250ft/76.2m) based on average right-of-way and structure widths, according to BLM WO-300 (Minerals and Realty Management).

Infrastructure (communication towers)

This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.5 acres (1.0ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)

This point dataset will be compiled from the FAA's Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.5 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other Developed Rights-of-Way

Currently, no additional data sources for other rights-of-way have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in the categories

described above. The newly purchased IHS data do contain pipeline information; however, this database does not currently distinguish between above-ground and underground pipelines. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to those used with the threats described above.

b. Habitat Degradation Threat Combination and Calculation

The threats targeted for measuring human activity (Table 2) will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. Individual datasets, however, will be preserved to indicate which types of threats may be contributing to overall habitat degradation.

This measure has been divided into three submeasures to describe habitat degradation on the landscape. Percentages will be calculated as follows:

> Measure 2a. Footprint by geographic area of interest: Divide area of the active/direct footprint by the total area of the geographic area of interest (% disturbance in geographic area of interest).
>
> Measure 2b. Active/direct footprint by historical sagebrush potential: Divide area of the active footprint that coincides with areas with historical sagebrush potential (BpS calculation from habitat availability) within a given geographic area of interest by the total area with sagebrush potential within the geographic area of interest (% disturbance on potential historical sagebrush in geographic area of interest).
>
> Measure 2c. Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given geographic area of interest by the total area that is current sagebrush within the geographic area of interest (% disturbance on current sagebrush in geographic area of interest).

B.3. Energy and Mining Density (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of energy and mining threats identified in Table 2. This measure will provide an estimate of the intensity of human activity or the intensity of habitat degradation. The number of energy facilities and mining locations will be summed and divided by the area of meaningful geographic areas of interest to calculate density of these activities. Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed

below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

Table 6. Geospatial data sources for habitat degradation (Measure 2).

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

a. Energy and Mining Density Datasets and Assumptions

Energy (oil and gas wells and development facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (coal mines)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (wind energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (solar energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (geothermal energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Mining (active developments; locatable, leasable, saleable)

(See Section I.B.2., Habitat Degradation Monitoring.)

b. Energy and Mining Density Threat Combination and Calculation

Datasets for energy and mining will be collected in two primary forms: point locations (e.g., wells) and polygon areas (e.g., surface coal mining). The following rule set will be used to calculate density for meaningful geographic areas of interest including standard grids and per polygon:

1) Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
2) Polygons will not be merged, or features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
3) The analysis unit (polygon or 640-acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit, all point features will be summed, and any individual polygons will be counted as one (e.g., a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g., a polygon crossing multiple 640-acre

sections would be counted as one in each 640-acre section for a density per 640-acre-section calculation).

4) In methodologies with different-sized units (e.g., MZs, populations, etc.) raw facility counts will be converted to densities by dividing the raw facility counts by the total area of the unit. Typically this will be measured as facilities per 640 acres.
5) For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
6) Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help display and convey information about areas within meaningful geographic areas of interest that have high levels of energy and/or mining activity.
7) Additional statistics for each defined unit may also include adjusting the area to include only the area with the historical potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Individual datasets and threat combination datasets for habitat degradation will be available through the BLM's EGIS web portal and geospatial gateway. Legacy datasets will be preserved so that trends may be calculated.

C. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to the BLM according to the terms of the forthcoming Greater Sage-Grouse Population Monitoring Memorandum of Understanding (MOU) (2014) between WAFWA and the BLM. The MOU outlines a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information for the purposes of implementing sage-grouse LUPs/amendments and subsequent effectiveness monitoring. Population areas were refined from the "Greater Sage-grouse *(Centrocercus urophasianus)* Conservation Objectives: Final Report" (COT 2013) by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and to inform the adaptive management responses.

D. Effectiveness Monitoring

Effectiveness monitoring will provide the data needed to evaluate BLM and USFS actions toward reaching the objective of the national planning strategy (BLM IM 2012-044)—to conserve sage-grouse populations and their habitat—and the objectives for the land use planning

area. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this LUP. Effectiveness data used for these larger-scale evaluations will include all lands in the area of interest, regardless of surface ownership/management, and will help inform where finer-scale evaluations are needed, such as population areas smaller than an LUP or PACs within an LUP (described in Section II, Fine and Site Scales). Data will also include the trend of disturbance within these areas of interest to inform the need to initiate adaptive management responses as described in the land use plan.

Effectiveness monitoring reported for these larger areas provides the context to conduct effectiveness monitoring at finer scales. This approach also helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines, without excluding the possibility of concurrent, finer-scale evaluations as needed where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse national planning strategy, the BLM and the USFS will evaluate the answers to the following questions and prepare a broad- and mid-scale effectiveness report:

1) Sagebrush Availability and Condition:
    a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
    b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre-EuroAmerican historical distribution of sagebrush (BpS)?
    c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?
2) Habitat Degradation and Intensity of Activities:
    a. What is the amount of habitat degradation and the change in that amount?
    b. What is the intensity of activities and the change in the intensity?
    c. What is the amount of reclaimed energy-related degradation and the change in the amount?
3) What is the population estimation of sage-grouse and the change in the population estimation?
4) How are the BLM and the USFS contributing to changes in the amount of sagebrush?
5) How are the BLM and the USFS contributing to disturbance?

The compilation of broad- and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule (see Attachment A), which may be accelerated to respond to critical emerging issues (in consultation with the USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and inform the BLM and the USFS adaptive

management strategy (see the adaptive management section of this Environmental Impact Statement).

To determine the effectiveness of the sage-grouse objectives of the land use plan, the BLM and the USFS will evaluate the answers to the following questions and prepare a plan effectiveness report:

1) Is this plan meeting the sage-grouse habitat objectives?
2) Are sage-grouse areas within the LUP meeting, or making progress toward meeting, land health standards, including the Special Status Species/wildlife habitat standard?
3) Is the plan meeting the disturbance objective(s) within sage-grouse areas?
4) Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies indicate the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM's EGIS web portal and the geospatial gateway.

Methods

At the broad and mid scales (PACs and above) the BLM and the USFS will summarize the vegetation, disturbance, and (when available) population data. Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to report the metrics appropriately and may need to be combined to provide an estimate with an acceptable level of accuracy. Otherwise, they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM and the USFS will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas owing to successful restoration; and the amount of new disturbance the BLM and/or the USFS has permitted. These data could be supplemented with population data (when available) to inform an understanding of the correlation between habitat and PACs within a population. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, National Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will use the information from Measure 1a (I.B.1., Sagebrush Availability) and calculate the change from the 2012 baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (I.B.1., Sagebrush Availability) will be used. To calculate the trend in the condition of sagebrush at the mid scale, three sources of data will be used: the BLM's Grass/Shrub mapping effort (Future Plans in Section I.B.1., Sagebrush Availability); the results from the calculation of the landscape

indicators, such as patch size (described below); and the BLM's Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data are collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal, and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid scales will be used, along with the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with the Natural Resources Conservation Service (NRCS). The objective of the LMF effort is to provide unbiased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. *in press*), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented the Agricultural Research Service, BLM, NRCS, USFWS, WAFWA, state wildlife agencies, and academia. The common indicators identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-Grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS National Resources Inventory Rangeland Resource Assessment (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb1041620).

The sage-grouse intensification baseline data will be collected over a 5-year period, and an annual sage-grouse intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report, which will be available on an annual basis thereafter, contingent on continuation of the current monitoring budget. This information, in combination with the Grass/Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the National Planning Strategy Effectiveness Report.

Calculating Question 2, National Planning Strategy Effectiveness: Evaluations of the amount of habitat degradation and the intensity of the activities in the area of interest will use the information from Measure 2 (Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (Section I.B.3., Energy and Mining Density). The field office will collect data on the amount of reclaimed energy-related degradation on plugged and abandoned and oil/gas well sites. The data are expected to demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the National Planning Strategy Effectiveness Report.

Calculating Question 3, National Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 3 of the National Planning Strategy Effectiveness Report.

Calculating Question 4, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of sagebrush in the area of interest will use the information from Measure 1a (Section I.B.1., Sagebrush Availability). This measure is derived from the national datasets that remove sagebrush (Table 3). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in the geographic areas of interest. This information will be used to answer Question 4 of the National Planning Strategy Effectiveness Report.

Calculating Question 5, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of disturbance in the area of interest will use the information from Measure 2a (Section I.B.2., Monitoring Habitat Degradation) and Measure 3 (Section I.B.3., Energy and Mining Density). These measures are all derived from the national disturbance datasets that degrade habitat (Table 6). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in the geographic areas of interest. This information will be used to answer Question 5 of the National Planning Strategy Effectiveness Report.

Answers to the five questions for determining the effectiveness of the national planning strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad-scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence that the objectives of the national planning strategy to maintain populations and their habitats have been met. Conversely, where information indicates that sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and/or

populations are declining relative to the baseline, there is evidence that the objectives of the national planning strategy are not being achieved. Such a determination would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

With respect to the land use plan area, the BLM and the USFS will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM/USFS surface management areas and will help inform where finer-scale evaluations are needed, such as seasonal habitats, corridors, or linkage areas. Data will also include the trend of disturbance within the sage-grouse areas, which will inform the need to initiate adaptive management responses as described in the land use plan.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting land health standards (as articulated in "BLM Handbook 4180-1, Rangeland Health Standards") in sage-grouse areas will be used to determine the LUP's effectiveness in meeting the vegetation objectives for sage-grouse habitat set forth in the plan. The field office/ranger district will be responsible for collecting this data. In order for this data to be consistent and comparable, common indicators, consistent methods, and an unbiased sampling framework will be implemented following the principles in the BLM's AIM strategy (Taylor et al. 2014; Toevs et al. 2011; MacKinnon et al. 2011), in the BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005), and in the HAF (Stiver et al. *in press*) or other approved WAFWA MZ–consistent guidance to measure and monitor sage-grouse habitats. This information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: Sage-grouse areas within the LUP that are achieving land health stands (or, if trend data are available, that are making progress toward achieving them)—particularly the Special Status Species/wildlife habitat land health standard—will be used to determine the LUP's effectiveness in achieving the habitat objectives set forth in the plan. Field offices will follow directions in "BLM Handbook 4180-1, Rangeland Health Standards," to ascertain if sage-grouse areas are achieving or making progress toward achieving land health standards. One of the recommended criteria for evaluating this land health standard is the HAF indicators.

Calculating Question 3, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used to determine the LUP's effectiveness in meeting the plan's disturbance objectives. National datasets can be used to calculate the amount of disturbance, but field office data will likely increase the accuracy of this estimate. This information will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Calculating Question 4, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available, and will be used to determine LUP effectiveness. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 4 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the LUP will be used to inform the need for finer-scale investigations, initiate adaptive management actions as described in the land use plan, initiate causation determination, and/or determine if changes to management decisions are warranted. The measures used at the broad and mid scales will provide a suite of characteristics for evaluating the effectiveness of the adaptive management strategy.

II. FINE AND SITE SCALES

Fine-scale (third-order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges during breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at the fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek or lek group within a population or subpopulation area. Fine- and site-scale monitoring will inform LUP effectiveness monitoring (see Section I.D., Effectiveness Monitoring) and the hard and soft triggers identified in the LUP's adaptive management section.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation. They also include vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (Section III), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan for the land use plan. The need for fine- and site-scale-specific habitat monitoring will vary by area, depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine- and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluation of the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM's AIM strategy (Toevs et al. 2011) and in "AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy" (Taylor et al. 2014). Approved monitoring methods are:

- "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011);
- The BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005); and,
- "Sage-Grouse Habitat Assessment Framework: Multiscale Assessment Tool" (Stiver et al. *in press*).

Other state-specific disturbance tracking models include: the BLM's Wyoming Density and Disturbance Calculation Tool (http://ddct.wygisc.org/) and the BLM's White River Data Management System in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine- and site-scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the AIM strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF; any such adjustments should be ecologically defensible. To foster consistency, however, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for making those adjustments. That justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site-scale indicators, they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer-reviewed by the appropriate wildlife management agency(ies) and researchers.

When conducting land heath assessments, the BLM should follow, at a minimum, "Interpreting Indicators of Rangeland Health" (Pellant et. al. 2005) and the "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011). For assessments being conducted in sage-grouse designated management areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and rollup analysis among management units; help provide consistent data to inform the classification and interpretation of imagery; and provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section I.D., Effectiveness Monitoring).

III. CONCLUSION

This Greater Sage-Grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid scales and provides a guide for the BLM and the USFS to collaborate with partners/other agencies to develop the land use plan- specific monitoring plan.

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Attachment A. An Overview of Monitoring Commitments

	Broad and Mid Scales					Fine and Site Scales
	Im piemen-tation	**Sagebrush Availability**	**Habitat Degradation**	**Population**	**Effectiveness**	
How will the data be used?	Track and document implementation ofland use plan decisions and inform adaptive management	Track changes in land cover (sagebrush) and inform adaptive management	Track changes in disturbance (threats) to sage-grouse habitat and inform adaptive management	Track trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	Characterize the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management	Measure seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculate disturbance, and inform adaptive management
Who is collecting the data?	BLMFOand USFS Forest	NOC and NIFC	National datasets (NOC), BLM FOs, and USFS Forests as applicable	State wildlife agencies through WAFWA	Comes from BLM FO and SO, other broad- and mid-scale monitoring types ,analyzed by the NOC	USFS Forests and RO (with partners)
How often are the data collected, reported, and made available to USFWS?	Collected and reported annually; summary report every 5 years	Updated and changes reported annually; summary report every 5 years	Collected and changes reported annua lly; summary report every 5 years	State data reported annually per WAFWA MOU; summary report every 5 years	Collected and reported every 5 years (coincident with LUP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
What is the spatial scale?	Summarized by LUP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by MZ and LUP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)
What are the potential personnel and budget impacts?	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained ; data management costs are TBD	At a minimum, current skills and capacity must be maintained ; data management and data layer purchase cost are TBD	No additional personnel or budget impacts for the BLM or the USFS	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment

Who has primary and secondary responsi-bilities for reporting?	1) BLMFO & SO; USFS Forest & RO 2) BLM & USFS Planning	1) NOC 2) WO	1) NOC 2) BLM SO, USFS RO, & appropriate programs	1) WAFWA & state wildlife agencies 2) BLM SO, USFS RO, NOC	1) Broad and mid scale at the NOC, LUPat BLM SO, USFSRO	1) BLMFO& USFS Forests 2) BLMSO& USFS RO
What new processes/ tools are needed?	National implementation datasets and analysis tools	Updates to national land cover data	Data standards and rollup methods for these data	Standards in population monitoring (WAFWA)	Reporting methodologies	Data standards data storage; and reporting

FO (field office); NIFC (National Interagency Fire Center); NOC (National Operations Center); RO (regional office) ; SO (state office) ; TBD (to be determined) ; WO (Washington Office)

Attachment B. User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historical Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

There are two anomalous map zones with 0% user and producer accuracies, attributable to no available reference data for the ecological systems of interest.

User accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? ***Commission Error*** equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user's accuracy).

Producer accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? ***Omission Error*** equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 – producer's accuracy).

Attachment C. Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*