

Appendix 6. State of Oregon Greater Sage-Grouse Habitat Mitigation Manual

This appendix presents the full text of the State of Oregon Greater Sage-Grouse Habitat Mitigation Manual Version 1.1, otherwise known as the Mitigation Manual. The Mitigation Manual was developed through the SageCon Mitigation Technical Team in 2014.



STATE OF OREGON

Greater Sage-Grouse Habitat Mitigation Manual

Version 1.1
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Contents of this Manual

The Greater Sage-Grouse Mitigation Manual (“Manual”) defines the processes and information necessary for understanding and participating in Oregon’s Sage-Grouse Mitigation Program. This program is expected to provide a consistent and integrated approach to fulfilling mitigation requirements for impacts to sage-grouse habitat on all public and private lands in Oregon.

Mitigation Manual Contents		
Section 1:	Introduction	Introduces the purpose and need for an integrated approach to sage-grouse mitigation, defines the goals of the mitigation program and objectives of the Manual, and summarizes the processes for generating and acquiring credits under the Manual
Section 2:	For Credit Producers	Defines the detailed processes and requirements for generating mitigation credits for sage-grouse habitat
Section 3:	For Permittees	Defines the detailed processes and requirements for acquiring credits to offset impacts to sage-grouse habitat
Section 4:	Governance and Adaptive Management	Outlines the processes and requirements for governance, administration, and adaptive management of the sage-grouse mitigation program
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APPENDIX A

APPENDIX B

1. INTRODUCTION

Sagebrush country in central and eastern Oregon is home to close-knit rural communities and an economy centered on agriculture and natural resources. It is also home to the greater sage-grouse, a species at risk and an important indicator of the overall health of sagebrush ecosystems. Those ecosystems are increasingly threatened by large-scale drivers that affect not only wildlife, but also the human communities and economic systems that depend on healthy and productive lands.

With the U.S. Fish and Wildlife Service considering whether to list the sage-grouse as threatened or endangered,¹ the State of Oregon is working with a diverse set of partners to build a strategy for balancing conservation and economic development in sagebrush country. The sage-grouse is very sensitive to the direct and *indirect effects*² of human development, including roads, fences, agricultural conversion, increased predation around human-impacted areas, and energy and infrastructure development, so steering those activities away from the most important and sensitive areas is critical.³ However, the greatest current threats to most sage-grouse populations in Oregon are large-scale ecological trends that cannot be managed through regulatory means, such as wildfire, invasive species, and encroachment by native

conifers.⁴ Sage-grouse are dependent on sagebrush and are declining along with the overall health of sagebrush habitats.⁵

A systematic, science-based mitigation program can help address both of these challenges. It can create incentives for future development to avoid the most important areas of sage grouse habitat, while providing funding for on-the-ground conservation efforts to manage the greatest current threats. Paired with other policies and local, state, and federal investments in conservation, a mitigation program can support rural economies and ensure that human impacts are compensated for in a way that provides a net benefit for sage-grouse, their habitat, and rangeland health in general.

As part of the development of the State's broader Greater Sage-Grouse Action Plan ("GSG Action Plan"), it is working closely with the Bureau of Land Management, the U.S. Fish and Wildlife Service, local governments, and other interested stakeholders to develop a shared approach to mitigation for impacts to sage-grouse across public and private lands. As used in this document, the term *mitigation* encompasses the full suite of activities to avoid, minimize, and compensate for adverse impacts to sage-grouse and *sage-grouse habitat*.⁶ The term *compensatory mitigation* is

¹ See U.S. Fish & Wildlife Service, Species Profile: Greater sage-grouse (*Centrocercus urophasianus*), <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06W> (2014).

² See Glossary for definitions of italicized terms.

³ U.S. Fish & Wildlife Service, Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report, pp. 38-52 (February 2013) (hereafter "COT Report"), available at <http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/COT/COT-Report-with-Dear-Interested-Reader-Letter.pdf>.

⁴ Boyd, Chad S., Johnson, Dustin D., Kerby, Jay D., Svejcar, Tony J., & Davies, Kirk W., Of Grouse and Golden Eggs: Can Ecosystems Be Managed Within a Species-Based Regulatory Framework?, *RANGELAND ECOLOGY & MANAGEMENT* 67: 358-368 (2014).

⁵ Davies, Kirk W., Boyd, Chad S., Beck, Jeffrey L., Bates, Jon D., Svejcar, Tony J., & Gregg, Michael A., Saving the Sagebrush Sea: An Ecosystem Conservation Plan for Big Sagebrush Plant Communities, *BIOLOGICAL CONSERVATION* 144: 2573-2584 (2011).

⁶ See Clement, J. P. et al., A Strategy for Improving the Mitigation Policies and Practices of the Department of the Interior: A Report to the Secretary of the Interior from the Energy and Climate Change Task Force, p. 2 (2014) (hereafter "Interior Mitigation

used when describing actions designed to provide compensation for unavoidable impacts within a broader *mitigation hierarchy*.⁷

Effective mitigation for impacts to sage-grouse habitat must be integrated and coordinated with Oregon's broader approach to sage-grouse conservation and overall ecosystem health under the GSG Action Plan. The State's vision is to use mitigation as a tool for advancing sage-grouse habitat conservation within a larger science-based framework for conserving healthy sagebrush ecosystems and tracking and accounting for the outcomes of conservation investments. Because recovery of the sage-grouse depends on the maintenance and restoration of large areas of healthy, intact sagebrush habitat across public and private lands, implementing this vision will require an approach that is fundamentally **collaborative, strategic, and adaptive** (see Box 1.1).

The development of a Candidate Conservation Agreement with Assurances (CCAA) in Harney County, Oregon, helped lay the foundations for a collaborative, strategic, and adaptive approach to sage-grouse recovery.⁸

Strategy"), available at http://www.doi.gov/news/upload/Mitigation-Report-to-the-Secretary_FINAL_04_08_14.pdf.

⁷ See id. at p. 3.

⁸ A Candidate Conservation Agreement (CCA) based on the same principles also exists, called the Greater Sage-Grouse Programmatic Candidate Conservation Agreement for Rangeland Management on Bureau of Land Management Lands in Oregon and signed on May 30, 2013 by the Bureau of Land Management (BLM), the U.S. Fish & Wildlife Service, and the Oregon Cattlemen's Association (OCA) (see <http://www.fws.gov/news/ShowNews.cfm?ID=2144375259>).

Box 1.1

A **collaborative** approach to sage-grouse recovery is required to support healthy sagebrush ecosystems on the scale needed to manage *landscape-scale* threats such as wildfire and invasive species and to support large and interconnected sage-grouse populations. Managing these issues across large areas of public and private land requires an approach that builds local and regional support for conservation-oriented land management by integrating natural resource management and economic viability into a social structure that values natural resource conservation as part of its business model and way of life. With rural communities facing increasing social and economic threats, significant federal, state, and private investment will be needed to help fund and provide technical support for the conservation of sagebrush and sage-grouse. The mitigation approach described in this document can provide one source of investment to help ensure that conservation supports the social and economic health of rural communities by generating financial support for sage-grouse conservation practices within rural communities.

Coordinating multiple sources of investment across large landscapes requires a **strategic** approach. To make the most effective and efficient use of the funds available, they must be targeted based on best available science and information about landscape context and large-scale processes such as drought, fire and vegetation change, as well as on local knowledge about priorities at finer scale. The State's mitigation approach builds on multiple sources of information about conservation and development priorities, including landscape-scale decision support tools, work by the Eastern Oregon Agricultural Research Center and others on drivers of large-scale vegetation change, and the experience of the *State Sage-Grouse Technical Team* and *Local Implementation Teams* in identifying state- and local-level conservation priorities.

CONTINUED ON NEXT PAGE

A key outcome of the CCAA is a process for easily assessing the condition of vegetation, its potential value as sage-grouse habitat, and the management practices and disturbances that might result in a change to a less or more desirable vegetation state. This approach is used to determine appropriate conservation actions to provide improved sage-grouse habitat quantity and quality. The CCAA also includes adaptive management through periodic trend monitoring and adjustment of conservation actions as needed. The scientific basis for this approach and its ability to provide site-specific management recommendations informed by ongoing monitoring information make it uniquely suited to guiding management decisions in the highly spatially variable and rapidly changing ecosystems that make up Oregon's sage-grouse habitat.

The approach to sage-grouse habitat mitigation described in this document provides a framework for further refinement and broader adoption of the approach used in the Harney County CCAA and other similar efforts throughout the sage-grouse range. A quantitative and repeatable approach to mitigation decisions can integrate closely with CCAAs, other existing agreements, and other sources of public and private investment, including conservation banks, while ensuring that careful accounting of mitigation *debts* and *credits* results in a net benefit for sage-grouse and their habitat. Compensatory mitigation can provide one source of funding – among the many needed to meet social, economic, and conservation goals – for conservation actions that improve sage-grouse habitat and support the social and economic vitality of rural communities in sagebrush country.

⁹ This is anticipated to be a separate but complementary system to the Conservation Efforts Database developed by the U.S. Fish & Wildlife Service. See <https://conservationefforts.org/welcome/about/> and <http://www.fws.gov/greatersagegrouse/documents/20140730%20GRSG%20data%20call%20letter.pdf>.

Box 1.1 Continued

Finally, an **adaptive** approach to sage-grouse recovery uses information about the results of past and current conservation efforts to guide future decision-making. This information feedback loop is critical for making management decisions in a highly complex, variable, and unpredictable ecosystem. Quantifying, tracking, and effectively communicating the results of conservation actions can help identify the most effective management approaches, monitor long-term trends in ecosystem health, guide prioritization efforts, and increase and sustain investment by demonstrating real results. The approach to mitigation described in this document requires development of a system to track and account for impacts and improvements to sage-grouse habitat in Oregon. In order to better support collaborative, strategic, and *adaptive management*, this “conservation accounting system” should be integrated across public and private ownerships and should be used to track and communicate outcomes not only from development and mitigation actions, but also from the full diversity of public and private investments in sage-grouse habitat State-wide.⁹ Such an accounting system can greatly improve the effectiveness of conservation efforts over time, and it can help demonstrate and communicate the actual, on-the-ground impacts of *mitigation projects* and other conservation efforts.

This Manual's approach for mitigation for impacts to sage-grouse habitat is based on science outlined primarily in U.S. Fish and Wildlife Service's Conservation Objectives Report (COT)¹⁰ and the 2011 ODFW GSG Conservation Strategy.¹¹ These documents describe the key threats to sage-grouse and their habitat and offer biologically-based strategies for management and conservation.

¹⁰ COT Report, *supra* note 3.

¹¹ Hagen, Christian, Oregon Department of Fish and Wildlife, Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat (2011) (hereafter “2011 ODFW GSG Conservation Strategy”), available at http://www.dfw.state.or.us/wildlife/sagegrouse/docs/20110422_GRSG_April_Final%2052511.pdf.

The principles and elements of the mitigation program “conservation accounting system” that this Manual defines are derived from the U.S. Fish and Wildlife Service’s *Greater Sage-Grouse Range-Wide Mitigation Framework*,¹² the U.S. Fish and Wildlife Service’s *Policy for Evaluation of Conservation Efforts When Making Listing Decisions*,¹³ and the Department of the Interior’s 2014 mitigation strategy.¹⁴

1.1 Goals and Objectives

This Manual is part of the GSG Action Plan approach to avoiding, minimizing, and compensating for development impacts to all sage-grouse habitat in Oregon. The Manual represents the combined efforts of the State of Oregon, the Bureau of Land Management, and the U.S. Fish and Wildlife Service, and their partners and stakeholders, and it is the intent and expectation that those federal entities will work with the State to the extent practicable to use this approach to implement their existing and pending mitigation policies.

The Manual and associated tools and documents form part of the Oregon’s GSG Action Plan for conserving sage-grouse habitat, which also includes the following elements:

- State, federal, and private investments in strategies to reduce threats posed by wildfire and invasive species;

¹² U.S. Fish & Wildlife Service, *Greater Sage-Grouse Range-Wide Mitigation Framework* (2014), available at http://www.fws.gov/greatersagegrouse/documents/Landowners/USFWS_GRSG%20RangeWide_Mitigation_Framework20140903.pdf.

¹³ U.S. Fish & Wildlife Service, *Announcement of final policy: Policy for Evaluation of Conservation Efforts When Making Listing Decisions*, 68 Fed. Reg. 15100 (2003), available at <http://www.fws.gov/policy/library/2003/03-7364.pdf>.

¹⁴ Interior Mitigation Strategy, *supra* note 6.

- Methods to quantify impacts and benefits from actions taken on the ground;
- Landscape-level plans to guide where best to target conservation; and
- The various program and policy documents needed by individual organizations to guide their own actions.

The intent of this Manual is to guide and coordinate permitting decisions for state and federal agencies and local governments related to activities in sage-grouse habitat, regardless of the future status of the species under the federal Endangered Species Act. This Manual describes the guidelines, processes, and decisions for quantifying debits and credits and will provide certainty and transparency that approved actions on the ground are contributing to the recovery of the species. It will be the foundation for sage-grouse mitigation for all major permitting agencies in Oregon.

The mitigation program expressed in this Manual has three overarching goals.

1. Provide a *net conservation benefit* for sage-grouse and sage-grouse habitat at both the individual project scale and at across the entire mitigation program.
2. Support responsible economic development and the long-term social and economic vitality of rural communities and rangeland health; and
3. Provide an approach to permitting and mitigation decision-making that is:
 - Coordinated across public and private land ownerships and permitting processes; and
 - Predictable, transparent, equitable, and science-based.

This Manual is designed to achieve the following objectives:

1. Incentivize conservation of sage-grouse habitat and target compensatory mitigation credits and other sources of conservation funding to the sites and conservation actions with the highest

probability of aiding species recovery and supporting healthy sagebrush ecosystems (**Section 2**);

2. Use timely and predictable permitting processes and avoidance and minimization criteria to steer development away from the areas most important for supporting current sage-grouse populations and concentrate review on development actions with the greatest likely impacts to the species (**Section 3**);
3. Develop methods for tracking and accounting of development and conservation actions in sage-grouse habitat (**Sections 1.2.1 & 2.2**);
4. Identify tools for managing risk or *uncertainty* that collaboratively engage landowners in conservation and to ensure an adequate reserve of credits to guard against unforeseen losses of habitat or failed mitigation sites (**Section 2.2**);
5. Define ongoing requirements for verification, tracking, performance, and reporting for mitigation to ensure net benefit to the species and its habitat is achieved and sustained over time, and to help provide transparent information on activity (**Sections 2.3 - 2.5**); and
6. Establish adaptive management and effectiveness monitoring frameworks to improve project and program performance over time, potentially including adding additional sagebrush species (**Section 4**).

Box 1.2

For the purposes of this Manual, “*sage-grouse habitat*” refers to current or potential sage-grouse habitat. Information on the actual presence of sage-grouse on a site is not necessary to determine whether sagebrush habitat is or is not sage-grouse habitat. Current sage-grouse habitat is defined as land areas within the current range of the species (as defined and mapped in the 2011 ODFW GSG Conservation Strategy)¹⁵, that can support the greater sage-grouse. These are lands that have greater than 5% sage-grouse cover and less than 5% juniper or tree cover and some native grasses and/or forbs or other seasonal natural habitats such as wet meadows.

Potential habitat is defined as land areas within the current range of the species that have the potential, based on environmental conditions such as mean annual precipitation, topographic position, etc., to support sagebrush-dominated plant communities or other seasonal natural habitats such as wet meadows. Potential habitat may not currently support sage-grouse at any time during the year.

Figure 1.1 below provides a coarse-scale map of likely areas of current and potential habitat. However, a site-level assessment will be required to identify areas of habitat and non-habitat within the the project area of a particular debiting or crediting action.

Where questions, conflicts, or uncertainties arise in the application of this Manual, these goals and objectives should be used to guide case-by-case decisions by the responsible parties.

Following a brief overview of the program, the Manual sections are organized to provide the information needed for particular audiences:

- *Credit Producers*: individuals, entities, or groups generating credits as mitigation for

¹⁵ 2011 ODFW GSG Conservation Strategy, *supra* note 11, at pp. 7-10, Section III, & Section IV.

unavoidable sagebrush impacts (**Section 2**);

- *Permittees and Permitting Agencies*: county governments, the State of Oregon and its agencies, the Bureau of Land Management, other permitting agencies, and permit applicants to those agencies (**Section 3**); and
- *Program Administrators*: those operating the mitigation program (**Section 4**).

Figure 1.1 – Maps of Current and Potential Sage-Grouse Habitat in Oregon



1.2 Program Overview

This section provides a brief overview of the steps used to generate and acquire credits for sage-grouse mitigation, and for the administrator to manage the program. These steps are also depicted in **Figure 1.2**. Blue chevrons signify the steps undertaken to generate credits, green chevrons represent the steps to acquire credits, and the grey connector represents the role of the program administrator (see **Section 4** for details on organizational structure and roles). These processes are defined in greater detail in **Sections 2 and 3** of this document.

1.2.1 Generating Credits

The following steps outline the process to generate, verify, and *register* credits from a conservation project:

1. **Propose crediting project:**

Crediting projects may be proposed through a periodic request for proposals (RFP) under the state's *in-lieu fee* program by the program administrator. Proposals under the in-lieu fee program will be evaluated based on scientific and management priorities, criteria, and guidelines developed by the State Technical Team and input from the Local Implementation Teams, and approved by the governance board. Selected projects will receive grants from the in-lieu fee program to implement conservation practices.

Projects may also be proposed by permittees intending to conduct their own compensatory mitigation projects to *offset* development impacts, by mitigation

bankers, or through recommendation of the program administrator, State Technical Team, Local Implementation Teams, governance board (see **Section 4.1** for detailed descriptions of implementation roles), landowners, or other interested federal, State, and local partners. Credits that are not used by the credit developer to offset their own development impacts may be sold to the in-lieu fee program.

Permitting agencies will require all permittees developing *permittee-responsible compensatory mitigation* (PRM) projects to meet the same standards and requirements as in-lieu fee projects. Permitting agencies will also require permittees developing PRM projects to meet the same standards and requirements as all other permittees, including attending a pre-planning meeting with a mitigation review team and submitting a detailed draft mitigation plan as described in **Section 3**.

2. **Calculate credits:**

Credit producers develop a draft site-specific management plan and use the *quantification method* to estimate the expected number of credits, with or without the assistance an ODFW mitigation biologist or other technical support provider. A full proposal with management plan, quantification method results, and credit estimate are submitted to the program administrator for review. The program administrator makes final decisions about which proposed projects are funded by the State's in-lieu fee fund and ensures all projects, including PRM projects, are consistent with the ODFW Sage-Grouse Habitat Mitigation Policy and this Manual. The governance board helps identify in-lieu fee funding priorities by reviewing and ranking proposed projects, based on priorities recommended by the State

Figure 1.2 - Overview of Steps in the Mitigation Program Process

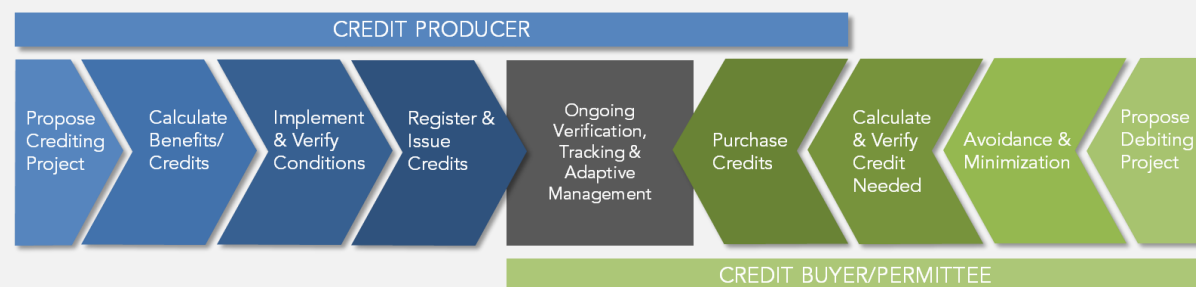


Table 1.1 - Documents Supporting this Manual

Document	Anticipated Complete Date
1. GSG Action Plan	07/15/15
2. Memorandum of Agreement by cooperating agencies	07/15/15
3. ODFW sage-grouse habitat mitigation policy	07/15/15
4. Document templates	12/31/15
5. Guidelines for in-lieu fee fund management	09/30/15
6. Table of conservation measures	12/31/15
7. Draft quantification tool and manual	09/30/15
8. Oregon Rangelands Decision Support System	complete

Technical Team and Local Implementation Teams.¹⁶

reports whether performance standards are met. If performance standards are met or partially met, this would allow the release of credits, as described in **Section 2**.

3. **Implement actions and verify conditions:**

Credit producers implement conservation practices and refine calculations based on post-project conditions on the ground. All projects undergo verification by ODFW or an ODFW-accredited third-party verifier to confirm that the Manual and associated policies and agreements were followed correctly and estimated credits have been appropriately calculated and match actual on-the-ground conditions.

4. **Register and issue credits:**

Once a project has been verified, supporting documentation is submitted to the program administrator, who reviews it for completeness before credits are registered and issued to the credit producer's account on a state-wide *registry*. Upon issuance, credits from a project are given a serial number so they can be tracked over time. Credit producers confirm through *monitoring*

¹⁶ If sage-grouse is listed under the federal Endangered Species Act (ESA), the State will seek approval from the U.S. Fish and Wildlife Service, either through a 4(d) exemption or through other means, to meet ESA requirements through the continued use of this system and through the same program administrator. The Fish and Wildlife Service will also sit on the State governance board (see Section 2).

1.2.2 Acquiring Credits

The following steps outline the process to determine and meet mitigation responsibilities consistent with the ODFW Sage-Grouse Habitat Mitigation Policy. Permittees are encouraged to consult with their permitting agency to set up a pre-planning meeting with ODFW and all relevant permitting agencies at least 45 days prior to submitting a permit application or proposing an action that may impact sage-grouse habitat.

1. Propose debiting project:

A permitting agency receives a permit request or proposes an action with potential impact to sage-grouse habitat. The agency determines whether the development activity requires consistency with the ODFW Sage-Grouse Mitigation Policy and convenes a *mitigation review team* composed of a staff lead from ODFW and all relevant permitting agencies, including county staff for projects that require local land use review.

2. Avoidance and minimization review:

The Permittee submits a draft mitigation plan to the permitting agency, which the mitigation review team evaluates to determine whether avoidance and minimization measures are sufficient to ensure consistency with the ODFW Sage-Grouse Habitat Mitigation Policy. Impacts that can be feasibly avoided or minimized, as defined in that policy, must be. The permitting agencies will disapprove the permit application if avoidance and minimization requirements are not met.

3. Calculate and verify credits needed for compensatory mitigation:

If the mitigation review team determines that compensatory mitigation for impacts to sage-grouse habitat is required, the permittee (or designee) uses the quantification method to calculate the number of credits needed to meet the State of Oregon's net conservation

benefit standard¹⁷ by determining *baseline* and post-project conditions of the debit site. The mitigation review team ensures that protocols are followed correctly and projected debits are appropriately calculated. The project may then be permitted, pending other permit requirements.

4. Purchase or create credits:

A Permittee may purchase needed credits by paying a fee in lieu to the fund manager, or may propose their own crediting projects to meet compensatory mitigation requirements. All credits are tracked using unique serial numbers that identify the source of each credit. Once credits are transferred, permittees can use that information for internal and external reporting. All permitted projects are also added to the State's registry of impacts to sage-grouse habitat. ■

¹⁷ ORS 498.500

2. FOR CREDIT PRODUCERS: GENERATING CREDITS FOR COMPENSATORY MITIGATION

Mitigation credits may be produced through funding provided by the state's in-lieu fee program, or may be created and used by permittees conducting their own compensatory mitigation projects to offset development impacts.¹⁸ Projects may be proposed through a specific, periodic request for proposals (RFP) by the program administrator, or at any time by permittees or mitigation bankers, or through recommendations made to the program administrator by the State Technical Team, Local Implementation Teams, governance board, or other interested federal, state, and local partners. This section describes the process for developing sage-grouse habitat credits—for compensatory mitigation or for targeting and tracking other conservation investments – including the review and approval process for a compensatory mitigation site or bank.

The overall management goal of crediting projects is to achieve a more desired *ecological state* that can serve the habitat needs of sage-grouse or to maintain such a state in the face of current and future threats. Researchers on sagebrush ecosystem health and sage-grouse habitat have developed ecological models that describe factors that impact plant community composition and structure over time. These models, provided in Appendix A, have been used to identify management actions to address specific threats and improve habitat quality for sage-

grouse.¹⁹ They also form the basis for identifying *conservation measures* that may be appropriate at a site given its ecological context and current and likely future threats. A draft table of eligible conservation measures is provided in Appendix B²⁰, and both models and measures will be updated and refined as new information becomes available, as part of the annual adaptive management cycle for the mitigation program to reflect new science and restoration techniques (see **Section 4**).

In general, credits are generated by projects that:

- Transition an area of sage-grouse habitat from a less to a more desirable ecological state (*enhancement*);²¹ and/or
- Prevent undesirable state changes in areas that are at risk of degradation from threats such as fire, invasive species, conifer encroachment, or loss of habitat due to development (*avoided loss*).

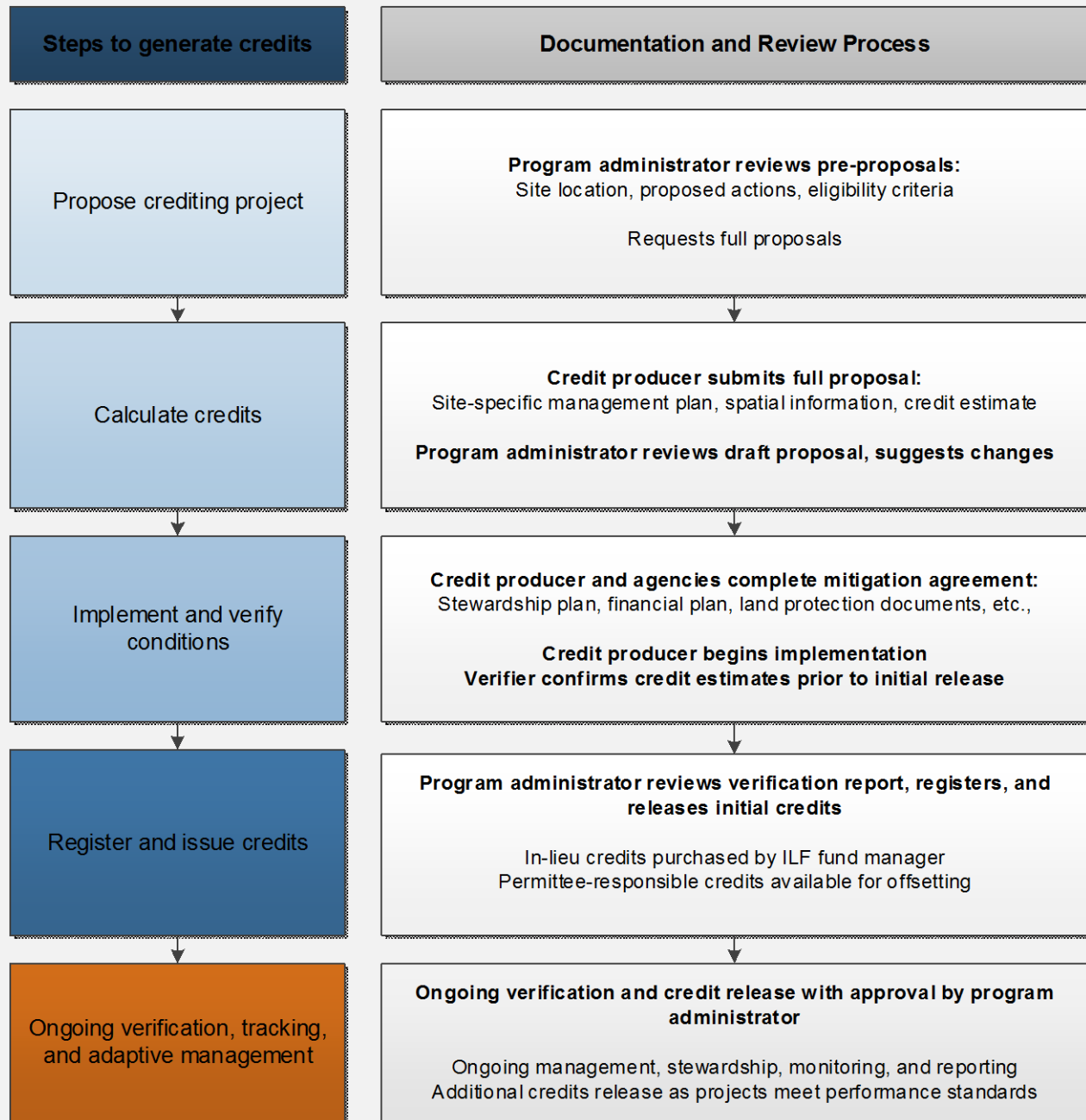
¹⁸ The in-lieu fee program will be managed by a State agency as described in Section 3.1 according to guidelines to be developed in 2015 (see Table 1.1). Permittee-responsible mitigation (PRM) and in-lieu fee (ILF) projects must meet the same standards and follow the same processes to ensure consistency with the Mitigation Manual and associated policies and agreements, including the ODFW Sage-Grouse Habitat Mitigation Policy.

¹⁹ Boyd et al., *supra* note 4

²⁰ Information provided in Appendix B is a working draft developed by the SageSHARE project team.

²¹ This term is intended to encompass the traditional categories of habitat creation and restoration, although it is anticipated that habitat creation activities with a high likelihood of failure would be significantly discounted by the quantification tool, or discouraged or excluded by the program administrator.

Figure 2.1 - Overview of Credit Generation Process



2.1 Proposing a Crediting Project

Eligibility criteria help to ensure that crediting projects will provide a net conservation benefit to sage-grouse habitat and support the long-term function of sagebrush ecosystems. The program administrator determines whether proposed projects meet all eligibility requirements.

To generate credits on public or private lands, a mitigation site will need to occur in current or potential sage-grouse habitat and meet the detailed eligibility criteria in **Table 2.1**. The proposal review process will include a pre-proposal step to screen for project eligibility and provide a rough estimate of credit potential based on remotely sensed information in the Oregon Rangelands Decision Support System. For large scale or complex projects, the State Technical Team will review and comment on proposals. Final decisions

on approving and/or funding proposed crediting projects will be made by the program administrator, with input from the State Technical Team and governance board on general funding priorities.

2.1.1 Project additionality

Additionality refers to the requirement that credit-generating benefits from a project must be in addition to what would have happened without participation in the program and what is required by existing law and legal commitments.²² Each crediting project will receive credit only for actions that are considered additional, in order for the State to meet its commitment to providing a net conservation benefit for the species.

To meet the mitigation program goal of providing a net benefit for sage-grouse and

Table 2.1 - Eligibility Requirements for Crediting Projects

Eligibility Requirement	Criteria
Conservation measures are additional	<ul style="list-style-type: none">■ Exceeds pre-existing legal obligations■ Avoidance or minimization of existing impacts■ Use of public conservation funds prohibited from generating credits
Project benefits are durable	<ul style="list-style-type: none">■ No imminent threat■ Benefits expected to meet or exceed duration of impact■ Legal protection of site■ Plan and funding for long-term stewardship
Appropriate site selection and conservation measures	<ul style="list-style-type: none">■ Projects integrated with state-wide strategic conservation plan■ All projects include enhancement actions
Conservation measures are additional	<ul style="list-style-type: none">■ Exceeds pre-existing legal obligations■ Avoidance or minimization of existing impacts■ Use of public conservation funds prohibited from generating credits

²² See Interior Mitigation Strategy, *supra* note 6, at p. 6.

their habitat, credit-producing conservation measures must exceed all existing affirmative obligations (including land use restrictions) relevant to the *project site* and comply with all applicable federal, state, and local laws. Only actions in excess of existing affirmative legal obligations will be creditable.

Credit producers must demonstrate that existing (pre-project) land uses have a neutral or positive effect on sage-grouse habitat function. In other words, existing adverse land-use impacts to sage-grouse must be addressed before crediting can occur. This may be demonstrated through enrollment in a Candidate Conservation Agreement (with or without Assurances) or through development and implementation of a similar management plan approved by the program administrator or its designee.

Public funds specifically dedicated to conservation actions are prohibited from funding generation of compensatory mitigation credits. Projects that are partially funded by these public conservation funds may generate credits in proportion to the amount of private investment and non-conservation public funds. That is, the amount of credit generated by a project should be reduced by the proportion of public conservation funds used for the project.²³ Transportation, utility, county, and many other types of funds that are not restricted to providing conservation benefit may be used to generate credits. Public conservation funds may, however, be used to establish a revolving fund to generate credits in advance of impacts, provided those funds are repaid in full by credit purchasers. Public funds may be used

²³ U.S. Fish & Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Watershed Enhancement Board, Oregon Department of Fish & Wildlife, *Oregon Interagency Recommendations: Public Funds to Restore, Enhance, and Protect Wetland and At-Risk, Threatened and Endangered Species Habitats: Appropriate Uses of These Funds in Species and Wetland Mitigation Projects* (January 2008), available at <http://www.fws.gov/oregonfwo/LandAndWater/Documents/PublicFunding-final.pdf>.

to meet eligibility requirements (i.e., to meet existing obligations that are not eligible for crediting under the description of additionality above).²⁴

2.1.2 Project durability

Crediting projects must be *durable* – that is, the period of time that mitigation is effective must be equal or greater in duration to the impacts being offset.²⁵ Demonstrating project durability requires both legal protection and financial assurances to ensure appropriate management throughout the life of the credits.

Legal protection may be demonstrated through term or permanent conservation easements or through other tools that meet the above definition of durability, including deed restrictions, transfers of title, multiparty agreements, contractual documents such as conservation land use agreements, and regulatory mechanisms.²⁶ Because of the threat wildfire and invasive species pose to crediting projects, the State's approach to demonstrating durability will allow *dynamic permanent mitigation* projects developed under the in-lieu fee program to offset up to 50% of permanent impacts (see **Section 3.3.3**). Crediting projects may not be located on sites that are under imminent threat of direct or indirect disturbance likely to prevent the project from meeting performance standards. Recently acquired subsurface rights, split-estate rights, development plans, or development designations would constitute evidence of an imminent threat that may disqualify a site.

Funding for long-term management may be demonstrated through a non-wasting endowment, but the State will also explore

²⁴ *Id.*

²⁵ See Interior Mitigation Strategy, *supra* note 6, at p. 6.

²⁶ See Greater Sage-Grouse Range-Wide Mitigation Framework, *supra* note 12.

alternative approaches to long-term stewardship funding, such as establishing state-wide or local funds for on-going management rather than requiring individual endowments for each project.

Crediting projects on public lands must meet the same durability standards as projects on private lands. Land use planning designations are reversible and therefore insufficient to establish durable site protection, so demonstrating durability is likely to require a “layering” of protection tools sufficient to meet that standard. These may include, but are not limited to, planning designations, conservation rights-of-way, resource withdrawals, conservation easements, cooperative agreements, and Recreation and Public Purposes Act leases.

To ensure appropriate management for the life of the credits, each proposed crediting project must include a *stewardship plan* that identifies a long-term steward, stewardship goals and activities, the amount and source of funds needed for an endowment to maintain the site, and documentation of the time needed to implement the full stewardship plan. The stewardship plan is one set of documents the program administrator will require before releasing credits.

2.1.3 Selecting a mitigation site and site-appropriate conservation measures

Appropriate compensatory mitigation site selection is paramount to ensuring the mitigation program provides the greatest possible net conservation benefit for sage-grouse. Small, isolated sites are less likely to contribute to sustainable sagebrush ecosystems, and certain sites may be at higher risk of damage by wildfire or invasive species. Crediting projects should occur on current or potential sage-grouse habitat and should be targeted to the locations where the greatest benefit to sage-grouse habitat and populations can be provided.

Prior to release of a request for crediting proposals for the in-lieu fee fund, the State

Technical Team and Local Implementation Teams will recommend state- and local-level funding priorities to the State governance board. These priorities may identify regions, *priority areas for conservation* (PACs), habitat states, threat types, or specific conservation measures that will receive preference for funding. The governance board and State Technical Team should coordinate these priorities closely with BLM Regional Mitigation Strategies and Regional Mitigation Teams.

The state’s Oregon Rangelands Decision Support System will help the State Technical Team and governing board conduct site selection and prioritization. Specifically, the tool will identify areas likely to provide the greatest potential for protection and restoration/enhancement actions, as well as areas that are expected to show greater or lesser resistance and resilience to fire and invasive species. Information used to inform prioritization within the decision support system may include fragmentation, *connectivity corridors*, historical occupancy, and soil and vegetation characteristics of sage-grouse habitats. Permittees conducting permittee-responsible compensatory mitigation will be required by their permitting agency to consult with the program administrator for assistance in identifying appropriate compensatory mitigation sites to ensure consistency with ODFW’s Sage-Grouse Mitigation Policy.

Credits are generated by the following types of conservation measures:

- **Enhancement:** Measures that increase the quantity and/or quality of sage-grouse habitat and are aimed at transitioning an area of sage-grouse habitat from a less to a more desirable ecological state. Appropriate enhancement measures may vary among sites, depending on the initial and desired future ecological states of a site (see **Table of Conservation Measures, Appendix B**).
- **Avoided loss:** Measures that prevent undesirable state changes in areas that are at a demonstrated risk of degradation from threats such as development, wildfire, and invasive species. Depending on the current and anticipated future threats at a given site, appropriate avoided loss activities may

include legal protection, fire prevention, and management of invasive species. Credit may only be provided for avoided loss in proportion to the estimated likelihood of loss and when a project also includes enhancement activities. That is, credits for avoiding loss are discounted according to the probability that a given threat would have led to loss of the habitat over the life of the project.

Multiple conservation measures will likely occur on a single site. An assessment of the ecological states present on a crediting project site and of desired future states provides the basis for identifying and prioritizing conservation measures. Appendix B provides an overview of potential enhancement and avoided loss measures that may be considered, the current and desired states that those measures would be most appropriate for, and a relative assessment of the potential benefit, risk, time delay, duration, and cost associated with each.²⁷ Not all possible conservation measures will be appropriate for generating credits on every site.

Other conservation measures may be considered by the project administrator on a case-by-case basis if the gain in sage-grouse habitat function can be adequately quantified and clear and approved best practices exist for how to plan, implement, and maintain those conservation measures over time. Credit producers would need to provide the program administrator with a detailed scientific rationale and estimate of benefit for proposed creditable activities outside of those in Appendix B.

Each credit producer must develop and submit a *site-specific plan* (SSP), which identifies the extent, type, and description of all proposed conservation measures. Individual SSPs will describe:

- The type and location of ecological states present on the project site;
- Current and future threats to sage-grouse habitat function for the site; and
- Specific conservation practices that will be implemented on the site to maintain or improve habitat for the species.

A SSP may be developed by any credit producer or their designee, with or without assistance by the program administrator or a local mitigation biologist, soil and water conservation district, or other technical support provider. Those entities may assess fees for providing assistance. The program administrator will determine whether a SSP is appropriate and adequate and will consult with the State Technical Team as needed to ensure consistency with ODFW policy.

²⁷ The information on conservation measures is the best available at the time of Manual development. Appendices A and B should be updated annually to reflect new information, as described in the adaptive management process in Section 4 of this document.

2.2 Calculating Credits

Determining the amount of compensatory mitigation needed to ensure a net conservation benefit for a proposed development action requires a method for measuring the impact of the debiting project and the benefit of the crediting project.²⁸

Oregon's Sage-Grouse Habitat Quantification Tool (HQT), currently under development, is used to measure the results of both debiting and crediting projects. It will measure not only the quantity of habitat affected by an action, but also its quality in terms of functional value to sage-grouse.

The quantification tool will be:

- Sensitive to the landscape context of the site (e.g., location in a PAC, potential threats, connectivity, patch size, etc.);
- Repeatable, sensitive, accurate, and transparent;
- Practical, economical, and easy to use by both this mitigation program and other incentive programs; and
- Capable of assessing projects of different scales.

The HQT quantifies impacts and benefits in terms of functional habitat acres, by measuring specific habitat characteristics that reflect both the quantity and functional quality of habitat at a particular site. The HQT draws on both landscape-scale data incorporated into the Oregon Rangelands Decision Support System and site-level information collected at the location of a particular debiting or credit project. Individual indicators are combined into themes, described below, which are then summarized into a single functional acre score.

The HQT is being designed to address all major indicators of sage-grouse habitat quality

²⁸ This method is under development. The quantification method must be completed and approved before credits can be generated.

and suitability at the four spatial orders.²⁹ Some indicators will be addressed indirectly, or by proxy, when sampling or other issues make direct measurement impractical. A detailed list of indicators, a description of the methodology used to combine them into a single score, and scientific rationale and documentation are provided in a separate HQT Methods document, also under development.

1st and 2nd Order (Range-Wide Distribution and Population/Sub-Population Scale)

These orders are addressed within the eligibility requirements described in Section 2.1 of this manual, rather than in the quantification tool itself. All mitigation projects must be in current or potential habitat (i.e., within the species range), and debiting and crediting projects must be within the same WAFWA management zone (for in-lieu fee projects) or PAC or population area (for permittee-sponsored mitigation projects).

3rd Order (Local Scale)

Themes addressed by the HQT at the 3rd order scale include:

- **Habitat Importance:** Priority status of the site and proximity to important features such as leks and PACs;
- **Habitat Viability:** Ability of a site to meet year-round habitat needs of sage-grouse, based in part of current populations densities and distribution of limiting seasonal habitat types;
- **Fire and Invasive Species:** Proximity to invasive species, assessments of resistance/resilience, and likelihood of fire; and

²⁹ Connelly, J.W., K.P. Reese, and M.A. Schroeder. 2003. Monitoring of greater sage-grouse habitats and populations. University of Idaho, College of Natural Resources Experiment Station Bulletin 80. Moscow, ID. Stiver, S.J., E.T. Rinkes, and D.E. Naugle. 2010. Sage-grouse Habitat Assessment Framework. U.S. Bureau of Land Management. Unpublished Report. U.S. Bureau of Land Management, Idaho State Office, Boise, Idaho.

- **Human Modification:** Level of impact from human developments on and near the project site.

4th Order (Site Scale)

Themes addressed by the HQT at the 4th order scale include:

- **Vegetation Condition:** Assessment of ecological state, based on indicators such as cover or density of sagebrush, juniper, and non-native grasses, and the relative predominance of each of these;
- **Development Potential:** Likelihood of future human development, based on ownership, zoning, land use exclusion, and site potential for energy development; and
- **Biodiversity Co-Benefit:** Presence or absence of priority areas or crucial or critical habitat for species other than sage-grouse.

To apply the quantification method to a proposed project, a user will need to delineate the *assessment area* and collect information from geospatial information system (GIS) data sources and from the field. Most GIS information will be available through the state's Oregon Rangelands Decision Support System. The method must be run twice, first on the current condition and then to estimate the results of conservation measures 15-30 years in the future, depending on the anticipated time-to-benefit for a given measure (see Appendix B).³⁰ Credits for enhancement actions are estimated based on the difference in the projected future number of functional habitat acres and the assessment area from the current number of

³⁰ Time horizon for credit estimates will vary by site and practice and should be based on information regarding time to benefit as summarized in Appendix B.

functional habitat acres within that area.³¹ Credits for avoided loss are discounted in proportion to the likelihood that a given loss would have occurred.³² All other factors being equal, crediting projects that are most likely to be successful (e.g., because they occur in relatively intact habitat and use site-appropriate conservation measures are applied) will receive more credit.

2.2.1 Adjusting quantification method values based on risk and uncertainty

One of the most persistent sources of uncertainty in mitigation is the ability to accurately estimate the benefits provided by crediting projects. Unlike debiting projects, in which the results of development or conversion tend to be relatively certain and persistent, the long-term benefits of crediting projects tend to be difficult to measure or estimate. Benefits provided can vary as a result of extreme weather and other *force majeure* events, effectiveness of conservation measures, time lag between implementation of a measure and full performance, soils, and the effects of landscape-scale threats such as wildfire and invasive species. Additional areas of uncertainty specific to sage-grouse include the effects of climate change, lack of robust information on population connectivity, and lack of understanding of the processes necessary to restore sagebrush communities.³³ These sources of uncertainty must be addressed within the mitigation

³¹ For example, a site that is providing 10 functional acres of sage-grouse habitat before project initiation and 100 functional acres at the end of the project receives credit for 90 functional acres.

³² For example, if a site provides 100 functional acres of habitat in pre-project condition and is estimated to be at a 30% risk of loss to development over the project life, 30 functional acres of credit are available for avoided loss through legal protection from development.

³³ COT Report, *supra* note 3, at p. 14.

program and associated planning tools in order to ensure net benefit to the species.

The sage-grouse habitat quantification method addresses many elements of uncertainty (e.g., connectivity, patch size, habitat importance, likelihood of project success, etc.). Conservative eligibility requirements in the mitigation program, including long-term protection and stewardship requirements, also partially address the risk of project failure.

The primary remaining uncertainties relate to the risk of project failure or loss of habitat function due to fire, extreme weather, invasion by exotic species, or other unforeseen events. Significant uncertainty also exists around the quantification of avoided loss. In order to address the probability that a given site project will be affected by these adverse events in the course of a thirty-year *project life*, the program administrator will require permittees to purchase an additional 50% *reserve pool* contribution, beyond the credit amount needed to meet the net conservation benefit standard.³⁴ Those credits will help insure the mitigation program against the potential failure of projects. The program administrator and State Technical team will revisit the estimated probability of project failure as part of regular adaptive management reviews and adjust the reserve pool contribution requirement accordingly.

2.3 Implementing and Verifying Conditions

This section describes the process that all mitigation projects, whether through the in-lieu

³⁴ The reserve pool contribution is a rough estimate of the likelihood of project failure due to unforeseen events. Following development of the habitat quantification tool in 2015, the amount of the reserve pool contribution will likely be revised through the program's adaptive management process to more accurately reflect a conservative estimate of the risk of fire and other unforeseen events that are not adequately addressed within the quantification tool.

fee program or permittee-responsible compensatory mitigation, will use to verify the number of credits their project is projected to generate, as well as the number of credits actually generated over time through implementation.

2.3.1 Who does the verification?

The program administrator will either conduct site visits and other forms of verification in coordination with permitting agencies, or may designate one or more parties as third-party verifiers. Third parties could include consultants, conservation district staff, FWS or BLM staff or contractors, restoration professionals, or others. Verifiers should be formally trained by the program administrator, use standardized forms and processes, and have the expertise needed to use the quantification tool and identify problems with project implementation and outcomes. If third-party verifiers are used, they will be accredited by the program administrator or a designated entity based on evaluation of qualifications and training by ODFW or other species experts.

2.3.2 What is verified?

An initial verification will occur in year “zero” of a project. That includes a site visit and review of documentation. The initial verification confirms mitigation site eligibility, estimates of credits, and adequacy of stewardship/monitoring plans.

Verification of a site's ecological performance will occur regularly throughout the life of a project. Verification frequency should be outlined in the site-specific plan and may vary based on an individual mitigation site's characteristics and ongoing performance. The verification cycle below is a suggested default option, unless the credit producer proposes and the program administrator approves a modification based on relevant factors:

- **Year 0:** Full verification prior to signing a mitigation site agreement/instrument;

- **Years 1-5:** Annual review of monitoring reports and site visits as needed to confirm progress toward agreed-to performance standards;
- **Years 5 until 5 years after the last credit is sold (*project closure date*):** Review of at least 2 consecutive years of monitoring data prior to a new credit release (e.g., a project developer submits 2 consecutive years of monitoring reports leading up to a request for credits to show the site is meeting performance standards); and
- **Project closure date to Year 30:** As a site moves into stewardship, the project steward submits a monitoring report no less frequently than every 5 years until Year 30 of the project for the purposes of monitoring program effectiveness. The long-term protection and stewardship requirements described in **Section 2.1** are expected to result in perpetual maintenance of benefits after Year 30, and the program administrator or designee may conduct audits as needed to ensure expected benefits are being provided. The program administrator will identify a standard set of criteria, including but not limited to changes in land ownership, that would trigger an automatic audit.

If third-party verifiers are used, the program administrator will provide verifier training and a template document that defines the elements of a mitigation project that need to be verified.

credits if they believe the estimates are outside an acceptable margin of error;

- Specifically identifies (if possible) what measures worked and did not and other information important to adaptive management and increasing the knowledge base about mitigation success; and
- Identifies potential sources of future concern to track over time.

A draft version of the report is discussed with the credit producer, giving them an opportunity to address any identified problems or issues before formal submission of the report. A final report is then submitted to the program administrator within 30 days of conducting verification activities. If the sage-grouse is listed, monitoring reports will be made available to the US Fish and Wildlife Service.

2.3.3 Review and submit verification report

As part of verification, the verifier will produce a report that summarizes the results of verification. The report:

- Confirms eligibility and summarizes what was verified and on what dates;
- Either confirms the initial credit estimates or the increases or decreases

2.3.4 Differences in opinion and dispute resolution

Differences in opinion may occur between a verifier and a credit producer. These disagreements might involve the adequacy of documentation, whether the project was installed correctly, whether credits are estimated accurately, or whether a credit producer is planning well enough for ongoing performance costs. The resolution of these disputes depends on which entity acts as the verifier. When an agency conducts verification, disputes will likely be handled through the administrative and dispute resolution processes at that agency. When a third party conducts verification, dispute resolution processes should be determined ahead of time and incorporated into the contract for third party services. The program administrator may choose to set up internal processes to deal with disputes involving decisions made by the administrator. The program administrator may develop separate processes for minor and significant, or material, disputes. All dispute resolution processes will be consistent with applicable Oregon law and any other relevant laws.

2.4 Registering and Issuing Credits

With a verification report that confirms eligibility and credit quantification, the program administrator is ready to certify credits.

2.4.1 Approving a mitigation instrument

The program administrator will review the following documentation for completeness and accuracy. **Table 2.2** lists the documents needed to gain final approval of a *mitigation instrument* and release the initial phase of credits for sale.

2.4.2 Registering credits

The State of Oregon will identify or develop a database to track debiting (development) and crediting actions affecting sage-grouse habitat, including all permittee-responsible compensatory mitigation projects. All credits

Table 2.2 - Documents Needed for Final Approval

Document Title	Description
Eligibility checklist	Documentation of site eligibility
Credit estimate	Baseline and post-project estimates of sage-grouse habitat benefits generated by the quantification tool
Site-specific plan	Description of the location, extent, type, and design of conservation measures
Stewardship plan	Identification of stewardship costs, plans and timeline for demonstrating the availability of funding for stewardship (endowment or other tool) who will be the steward, how maintenance will be conducted, and contingency plans for events such as drought, wildfire, etc.
Financial management plan	Detailed <i>financial management plan</i> including initial costs (acquisition, field surveys, habitat restoration, capital equipment, etc.), on-going annual costs (monitoring, maintenance, management, reporting, contingency allocation, etc.), and stewardship funding requirements accounting for inflation and investment strategy
Land protection documents	Recorded easements and/or other legal instruments protecting the land for the duration of the credit life
Verification Report	Produced by a verifier and confirms the appropriateness of the documents listed above

and their accompanying documents must be recorded in that database for ODFW, U.S. FWS³⁵, and permitting agencies to determine compliance with applicable rules and laws, and for the program administrator to analyze whether the programmatic net conservation benefit goal is being met. The database will

include geographic locations, site-specific plans, verification documents, credit quantities, and credit purchases. Information on the general location of impacts and mitigation sites and the quantity of credits being generated and sold should be easily accessible to the public.

2.4.3 Credit release

Prior to selling or using any credits, a credit producer, whether providing credits to the in-lieu fee program or developing their own credits, must have an approved site-specific plan in place described in the sections above. The program administrator should conduct a final, pre-sale check-in with all relevant regulatory and permitting agencies to ensure full agreement on debit and credit amounts.

For projects under the in-lieu fee program, released credits will be automatically purchased by the in-lieu fee fund manager and payment issued to the credit producer. Credits developed by private mitigation bankers may also be sold to the in-lieu fee program, and unused credits from permittee-responsible mitigation projects may be sold to the program administrator at the program administrator's discretion. For permittee-responsible compensatory mitigation projects, credits that are released are available for offsetting impacts.

The governance board may recommend future development of a credit exchange, where mitigation credits may be freely bought

and sold. Regardless of project type, all credit sales need to be reported to the program administrator, who will use geospatial and other information provided in the proposal to record them in the State's registry database. For credit producers participating in the State's in-lieu fee program, the in-lieu fee fund manager disburses funds as described in the guidelines for in-lieu fee management.

Not all credits are released immediately on approval of a site-specific plan, recording of a land protection agreement, or project implementation. Similarly, some credits can be released as a project is implemented, but before it is achieving its full habitat function. *Phased release of credits* (releasing a limited number of credits from a project in stages prior to its completion) is a common way of balancing the need to demonstrate ecological benefits of a project with the need for up-front funds to finance implementation measures. For the in-lieu fee program, the timing of payments to credit producers will not necessarily match the timing of credit release in order to better match expenses with reimbursements.

A default credit release schedule is included below, although the schedule included in a specific mitigation proposal may have additional phases and requirements necessary for credit release. If performance standards are not being met (i.e., the project is not on a path to provide the projected number of credits), credit release may be halted as described in **Section 2.5.4** below.

Default Credit Release Schedule:

- **Phase 1:** 20% of projected credits are released on approval of site-specific plan and recording of a land protection agreement;
- **Phase 2:** Up to 20% of credits are released at the end of years 1 and 5 (up to 40% total) if site-specific plan measures have been implemented and appropriate progress toward performance standards is documented and verified;
- **Phase 3:** Up to 20% of credits are released when the stewardship

³⁵ U.S. FWS may require this in the case that the species is listed under the federal Endangered Species Act.

endowment is fully funded, provided appropriate progress toward performance standards is documented and verified; and

- **Phase 4:** All remaining credits are released when a site has met all of its final performance standards, based on verification of the final total number of credits produced at the site. If a site exceeds its final performance standards and generates additional credits, these credits will be released.

2.5 Ongoing Verification, Tracking, and Adaptive Management

For any mitigation site, the credit producer is responsible for conducting ongoing monitoring and demonstrating progress toward meeting the performance standards outlined in their site-specific plan. A credit producer needs to submit monitoring reports (before December 31 of each year in which a report is required) on the verification schedule agreed to in the site-specific plan to the program administrator for review. The program administrator or its designated verifier will review those reports.

2.5.1 Site-specific performance standards

Credit-generating sites will need to maintain a certain level of performance over time to sustain the habitat functions on which their credits are based. Every site will have an agreed-to set of measurable performance standards that need to be met at agreed-to time intervals. Performance standards for each mitigation site will be customized in the site-specific plan but should, at a minimum, require the credit producer to increase the functional sage-grouse habitat provided by the site above and beyond the level of the initial assessment. Performance standards should be built around the assessments of initial and desired future condition from the quantification tool, and should be based on the State's past experience with sagebrush ecosystem restoration and stewardship, available data on the needs of sage-grouse and other relevant species, and any reference/historic conditions that are applicable.

2.5.2 Requirements for monitoring and verification

The submitted monitoring reports need to demonstrate progress toward meeting and sustaining agreed-to performance standards and should include:

- A summary paragraph of overall site conditions, challenges (including unanticipated costs), and progress;
- A table demonstrating whether performance standards are being met, and what data/findings were used to support that demonstration;
- Documentation of circumstances in which site conditions improved beyond what was anticipated, and discussion of potential reasons why as input into the adaptive management aspect of the program;
- Recommendations for rectifying the site if performance standards are not being

met and an action plan for implementing such measures;

- A summary of credits sold, retired, or used; and
- Any suggested improvements in the mitigation program for the program administrator, ODFW, or the permitting agencies.

2.5.3 What happens if performance standards are not being met

Projects can fail to meet performance standards for three reasons: A) a force majeure event, such as wildfire, flooding, or extreme drought, that is beyond the credit producer's control; B) avoidable implementation failure, or actions that a credit producer has the ability to foresee and correct; and C) an unavoidable land use conflict. As program administrator, the State holds responsibility for the performance of crediting projects unless liability is transferred to credit producers through a contract.

Force majeure: When a project fails to meet performance standards as a result of a force majeure event, the credit producer should notify the program administrator as soon as possible, and both parties should work together to identify an acceptable time-frame and actions needed to correct the issue and return to a positive trajectory, if at all possible. At the end of that set time, the program administrator should re-evaluate the conservation outcomes. If the project is still failing to move toward performance standards, the program administrator should suspend the release of credits from the project and determine whether to allow access to any reserve pool of credits. **Credit producers are not required to replace credits already sold** but cannot sell more credits from the site unless it returns to meeting performance

standards. Permittee-responsible mitigation projects may access the reserve pool (at the program administrator's discretion) or may create their own pool of reserve credits to access in case of project failure.

Avoidable implementation failure: When a project fails because of actions or circumstances that the credit producer has the ability to foresee and correct, the credit producer should similarly notify the program administrator as soon as possible and work to identify an acceptable timeframe and actions needed to correct the issue and return to a positive trajectory. If the project remains deficient at the end of that time-frame, the program administrator will suspend the release of credits. The credit producer may then fix the practice to restart the credit release process, purchase replacement credits from the in-lieu fee program or reserve pool (at the discretion of the program administrator and at full cost plus a penalty), or begin a contract cancellation process. If a contract is cancelled due to implementation failure, the credit producer will be liable for the cost of all credits that were released for the site. Performance bonds may be required to ensure this responsibility is met.

Land use conflict: Land use conflict should generally be avoided through the durability requirements for eligibility described in **Section 2.1**. However, in rare cases, it may not be possible to legally preclude all incompatible uses on mitigation lands (for example, mining rights on some public lands or loss of land due to eminent domain). In general, when a project fails to meet performance standards because of a legally unavoidable land use conflict, the party creating the new impact is responsible for replacing the credits, either through purchasing credits through the in-lieu fee program or reserve pool (at the discretion of the program administrator) or by implementing a crediting project at another site. The program administrator and credit producer should work together to establish an acceptable time-line and means for replacing all lost credits. ■

3. FOR PERMITTEES: MEETING MITIGATION REQUIREMENTS AND ACQUIRING CREDITS

The following section outlines the steps permit applicants would take to determine the requirements for avoiding, minimizing, and compensating for impacts to sagebrush habitat by a proposed project. Permit applicants may include private landowners and businesses, local and state governments and agencies, and federal land management agencies seeking permits or approval for any of the *affected development activities* described below, as well as local, state, and federal agencies seeking to fund or implement those activities.

3.1 Proposing a Debiting Project

This section addresses development activities that are subject to avoidance, minimization, and compensatory mitigation requirements under new and existing statutes, regulations, ordinances, and/or formal agreements outlined in the GSG Action Plan. Affected development activities include those which:

- Negatively impact sage-grouse habitat and create spatially discrete and measurable impacts that are not defined as *de minimis* in referring policies and agreements;
- Are identified as threats to sage-grouse habitat, including those identified in the U.S. Fish and Wildlife Service's Conservation Objectives Report (COT)³⁶ and the 2011 ODFW GSG Conservation Strategy³⁷; and

- Are authorized³⁸, funded, or carried out by federal or state agencies or are defined as conflicting uses under Oregon's administrative rules related to local government approval of development actions in sage-grouse habitat (OAR 660-023-0115).

Actions that meet these criteria, including existing development activities that require re-permitting and that cause new impacts, are generally subject to avoidance, minimization, and compensatory mitigation requirements.

Table 3.1 provides an example list of such activities. Dispersed impacts resulting from activities such as undeveloped recreation and grazing, management of agricultural lands, and impacts from wildfire and invasive species are not subject to these requirements and will be addressed through other approaches outlined in the GSG Action Plan.

Permittees proposing affected development activities should consult with their permitting agency to set up a pre-planning meeting with a staff representative of ODFW and all other relevant permitting agencies at least 45 days prior to submitting a permit application or proposing an action that may impact sage-grouse habitat. Permitting agencies will refer the permittee to a mitigation biologist or other technical support provider, who may provide guidance and information to the permittee in developing a draft *mitigation plan* that is consistent with all relevant policies and agreements.

³⁶ COT Report, *supra* note 3, at pp. 38-52.

³⁷ 2011 ODFW GSG Conservation Strategy, *supra* note 11, at pp. 98-119. These threats are mentioned in the *Greater Sage-Grouse Conservation Strategy for Oregon*, OAR 635-140-0015(2)(b).

³⁸ The concept of authorization includes permits, licenses, and other forms of permission required by law. See HB 3086 § 2(1)(a).

Figure 3.1 - Overview of Permitting and Credit Acquisition Process

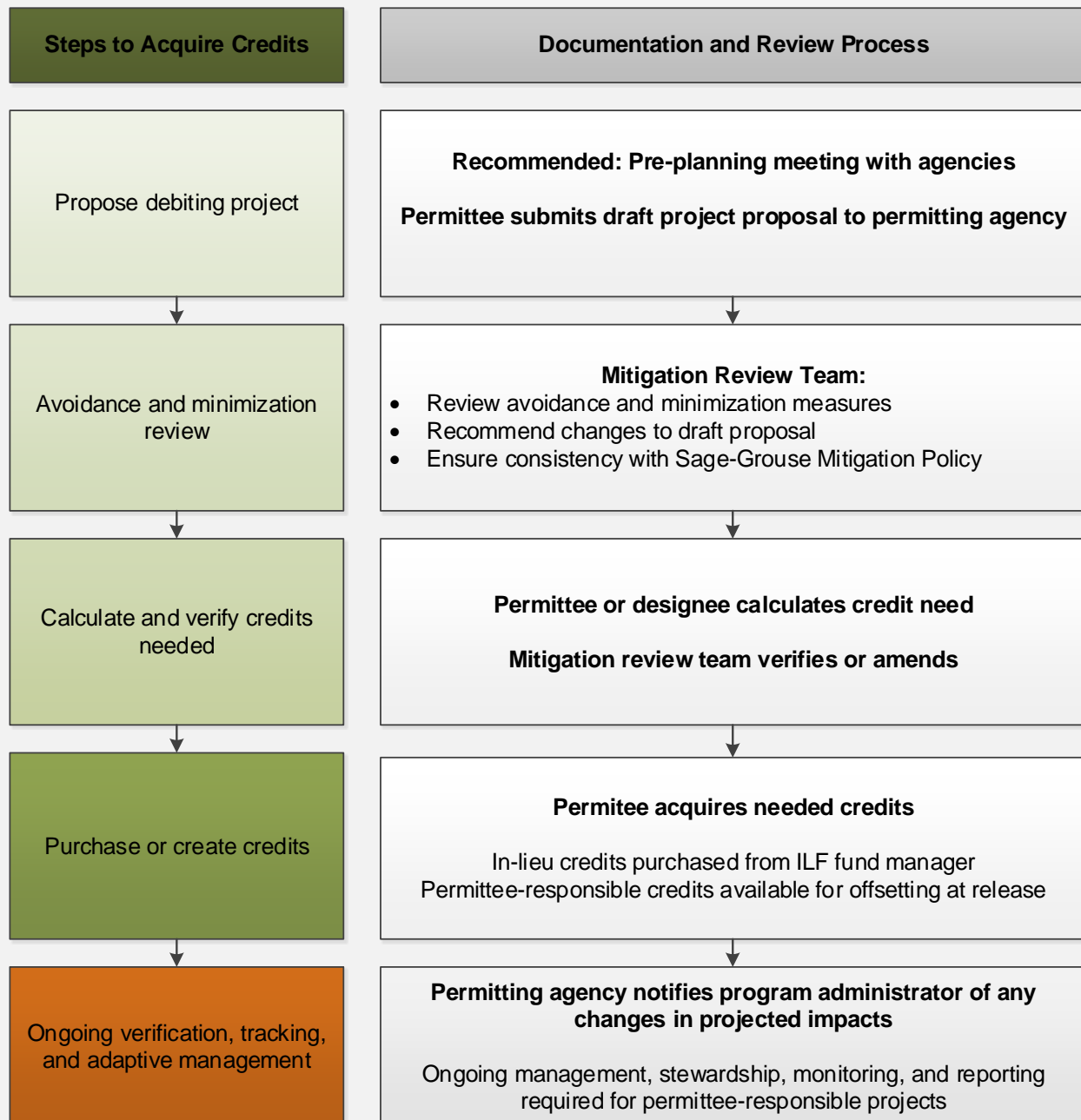


Table 3.1 - Examples of Development Activities Likely to Be Affected

Energy development and infrastructure
Locatable mining
Roads, railroads
Power lines
Communication towers

A methodology is currently under development for quantifying the impacts of these development activities on the functional value of sage-grouse habitat. Development activities not in **Table 3.1** should be reviewed by the permitting agency for impacts to sage-grouse, in coordination with the program administrator, on a case-by-case basis to determine whether they are subject to mitigation requirements.

3.2 Avoidance and Minimization Review

To initiate a review of sage-grouse impacts and mitigation requirements, a permittee provides the permitting agency with a draft mitigation plan that outlines avoidance and minimization measures, as well as an estimate of mitigation credits needed in order to provide a net benefit to sage-grouse and their habitat (see **Section 3.3** below).³⁹

The permitting agency will convene a mitigation review team, composed of staff members from ODFW and all permitting agencies relevant to the proposed project. The mitigation review team is convened on an ad hoc, project-by-project basis to review and evaluate the draft mitigation proposal and

ensure consistency with the mitigation approach outlined in ODFW's Greater Sage-Grouse Conservation Strategy for Oregon⁴⁰, the state's threshold for disturbance in core sage-grouse habitat⁴¹, this Manual, and all other relevant policies and agreements. Permittees proposing affected development activities should continue to communicate with the mitigation review team as needed to finalize an approved final mitigation plan. Guidelines for convening and operating a mitigation review team, including a process for timely dispute resolution, will be outlined in an interagency agreement.

The remainder of this section describes in detail the process of reviewing potential impacts to sage-grouse habitat, determining what impacts will be allowed, and determining the type and amount of mitigation. Details of avoidance, minimization, and compensatory mitigation requirements are based on anticipated policies and agreements currently under development, and may require updating as part of the Manual's annual adaptive management process (see **Section 4.2**).

³⁹ As described at OAR 635-140-0015 and 635-140-0025.

⁴⁰ OAR 635-140-0025

⁴¹ OAR 660-023-0115

Table 3.2 - ODFW and U.S. FWS Mitigation Hierarchies

ODFW (Oregon Administrative Rule 635-415-0005(16))	U.S. FWS (46 Fed. Reg. 7656)
1. Avoiding the impact altogether by not taking a certain development action or parts of that action;	1. Avoid the impact;
2. Minimizing impacts by limiting the degree or magnitude of the development action or parts of that action;	2. Minimize the impact;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;	3. Rectify the impact;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the development action and by monitoring and taking appropriate corrective measures;	4. Reduce or eliminate the impact over time;
5. Compensating for the impact by replacing or providing comparable substitute resources or environments.	5. Compensate for impacts.

3.2.1 Avoidance, minimization, and compensatory mitigation

Impacts to sage-grouse habitat must first be avoided and minimized in accordance with the ODFW Sage-Grouse Habitat Mitigation Policy⁴² and the U.S. Fish and Wildlife Service Mitigation Policy.⁴³ Before compensatory mitigation becomes an option, avoidance and minimization consistent with ODFW and U.S. FWS guidance on mitigation sequencing (see **Table 3.2**) are required for direct and indirect impacts to all sage-grouse habitat.

Avoidance

Avoidance refers to the process that ensures that if a proposed can occur in another location that avoids or reduces impacts to sage-grouse habitat, it must not be authorized, funded, or carried out at the originally proposed site.

⁴² In development. The general ODFW Habitat Mitigation Policy is stated at OAR Chapter 635, Division 415 and the Greater Sage-Grouse Strategy for Oregon at OAR Chapter 635, Division 140

⁴³ U.S. Fish and Wildlife Service. *Notice of Final Policy: U.S. Fish and Wildlife Service Mitigation Policy*, 46 Fed. Reg. 7656 (1981) (reaffirmed in U.S. Fish and Wildlife Service. 501 FW 2 (1993)).

For impacts subject to county land use permitting, the avoidance process to be followed is outlined in Oregon Administrative Rules (660-023-0115). Generally, large-scale developments in core and low-density habitat may proceed only if they can demonstrate that it is not technically feasible to locate the proposed development at a less impactful site and that the proposed development is dependent on unique geographic or other physical features that cannot be found on other lands. Impacts subject to other state or federal permitting processes may be required to meet other avoidance standards.

Minimization

Minimization refers to the process that ensures that, if impacts to sage-grouse habitat are unavoidable, the applicant attempts to revise the development activity in order to minimize impacts. Minimization can include changes in the siting, timing, design, and construction of a project and may also include rectifying or reducing the duration of the impact, when feasible. Impacts that may be subject to minimization requirements include direct impacts, indirect impacts, and fragmentation. The habitat quantification tool can support an analysis of minimization options by running multiple scenarios (e.g., development with different densities, locations, or configurations). On a case-by-case basis, the permitting agency in coordination with ODFW may request from the permittee an alternative development scenario not already presented to test for the feasibility of minimization.

For developments which create impacts and are subject to county land use permitting, the minimization process to be followed is outlined in Oregon Administrative Rules (660-023-0115). Generally, large-scale developments in core and low-density habitat may proceed only if they can demonstrate that the proposed use minimizes the amount of habitat directly or indirectly disturbed and the resulting fragmentation of habitat through micrositing, limitations on the timing of construction and/or use, and methods of construction. Some other uses, and uses in other sage-grouse habitat, may be required to demonstrate minimization, depending on the proximity to sage-grouse lek sites and/or the permitting agency or agencies involved. Impacts subject to other state or federal permitting processes may be required to meet other minimization standards.

Compensatory Mitigation

If avoidance and minimization options have been exhausted, compensatory mitigation will be required for all remaining large-scale development proposed in core and low-density habitat. Some other uses, and uses in other sage-grouse habitat, may also require compensatory mitigation, depending on the proximity to sage-grouse lek sites and/or the permitting agency or agencies involved.

For impacts subject to county land use permitting, the compensatory mitigation process to be followed is outlined in Oregon Administrative Rules (660-023-0115 and 635-140). Generally, development actions will be required to fully offset the direct and indirect adverse effects on sage-grouse. The state's standard for compensatory mitigation of impacts in sage-grouse habitat is to achieve net conservation benefit for sage-grouse by replacing the lost functionality of the impacted habitat to a level capable of supporting greater sage-grouse numbers than that of the habitat which was impacted. Impacts subject to other state or federal permitting processes may be required to meet other compensatory mitigation standards.

To determine the amount of compensatory mitigation needed to meet that standard, the permittee will use the approved version of the habitat quantification tool to determine the number and duration of credits needed to

meet the net conservation benefit standard as part of a draft mitigation plan. The staff review team will review the estimate and will approve or amend the credit requirement. The applicant may then either pay the in-lieu fee fund the value of the required credits or submit a proposal and SSP for a permittee-responsible project. Additional requirements for compensatory mitigation are explained in **Sections 3.3.2 – 3.3.3** below.

Development Threshold in Core Sage-Grouse Habitat

In addition to application of the mitigation hierarchy, the state and/or counties will adopt new land use policies to provide additional regulatory certainty and protection for sage-grouse habitat by setting a threshold limiting development in core sage-grouse habitat and by strengthening the State's habitat mitigation program. The new regulations will establish a threshold level of acceptable impacts to core sage-grouse habitat in each core area. This approach is described in the GSG Action Plan.

3.3 Calculating and Verifying Credits Needed

The process of quantifying debits using approved quantification methods is nearly identical to the process for quantifying credits described in **Section 2.2**. Permittees for affected development activities need to similarly define an assessment area, run the method on current conditions, and anticipate future conditions after project implementation. The primary difference is that future conditions need to be projected using an estimate of the direct and indirect impacts of the proposed development activity.

The sage-grouse quantification method currently under development that is described in **Section 2.2** will also be used for determining the credit needs of development projects.

To apply the quantification method to a proposed development action, a user will need to delineate the *assessment area* and collect information from geospatial information system (GIS) data sources and from the field. The method must be run twice, first on the current condition and then to estimate future condition based on impacts of the proposed development action. Impacts are quantified based on the projected future number of functional habitat acres within the assessment area, subtracted from the current number of functional habitat acres within that area. The State of Oregon will develop a database to track debiting (development) and crediting actions affecting sage-grouse habitat, including all permittee-responsible compensatory mitigation projects.

The mitigation review team is responsible for reviewing and approving the estimate of credit need proposed by the permittee. The program administrator or a designated third-party verifier will conduct site visits and other forms of verification in coordination with the mitigation review team and according to standards set by the program administrator in coordination. The number of credits needed is based on the quantification of credit need described in **Section 3.3** and must meet the State's net conservation benefit standard for

mitigation of impacts to sage-grouse and their habitat.⁴⁴

In order to address the probability that a given mitigation project will be affected by unforeseen adverse events in the course of its project life, the permittees will be required to purchase additional credits to provide 50% *reserve pool* contribution, beyond the credit amount needed to meet the net conservation benefit standard.⁴⁵ Reserve pool credits will help ensure the mitigation program against the potential failure of projects. The program administrator and State Technical team will revisit the rate of project failure as part of regular adaptive management reviews and adjust the reserve pool contribution requirement or adopt other tools for managing uncertainty and risk. The program administrator and governance board may also determine, as part of the program's adaptive management process, to require use of a *retirement ratio* or other tool to ensure the net conservation benefit standard is met.

3.3.1 Service areas

When compensatory mitigation is required for permitted impacts, that mitigation must occur

⁴⁴ ORS 498.500 states that "a mitigation bank or other mitigation framework...[must] not result in a net loss of either the quality or quantity of sage grouse habitat and [must provide] a net benefit to the quality or quantity of sage grouse habitat." OAR 635-140-0025 states that, "The standard for compensatory mitigation of habitat impacts in sage grouse habitat (core, low density, and general areas) is to achieve net conservation benefit for sage-grouse by replacing the lost functionality of the impacted habitat to a level capable of supporting greater sage-grouse numbers than that of the habitat which was impacted."

⁴⁵ The reserve pool contribution is a rough estimate of the likelihood of project failure due to unforeseen events. Following development of the habitat quantification tool in 2015, the amount of the reserve pool contribution will likely be revised through the program's adaptive management process to more accurately reflect a conservative estimate of the risk of fire and other unforeseen events that are not adequately addressed within the quantification tool.

on sage-grouse habitat (see **Box 1.2**) and create a net conservation benefit for sage-grouse within the Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone impacted by the development activity being offset (see **Table 3.2**). Impacts to sage-grouse habitat in Oregon must be offset by compensatory mitigation projects within the State boundaries and within the same WAFWA Management Zone.

Because the program administrator and State governance board are less able to target compensatory mitigation projects outside of the in-lieu fee program to ensure that net conservation benefit is provided at the appropriate spatial scale, further *service area* restrictions apply to permittee-responsible compensatory mitigation projects. For those projects, when appropriate and sufficient crediting opportunities are available:

- Impacts to *core area habitat* must be offset by crediting projects within the same PAC area;
- Impacts to *low-density habitat* must be offset by crediting projects within the most proximate PAC;
- Impacts to *general habitat* and core and low-density impacts for which PAC-specific credits are not available, must be offset by crediting projects within the same population area (see **Table 3.2**).

3.3.2 Duration and offsite and in-kind preference

Compensatory mitigation for impacts to sage-grouse habitat must be *durable* – that is, the period of time that mitigation is effective must be equal or greater in duration to the impacts being offset.⁴⁶ Because of the threat wildfire and invasive species pose to crediting projects, the State's approach to demonstrating

durability will allow *dynamic permanent mitigation* projects developed under the in-lieu fee program to offset up to 50% of permanent impacts. These projects may be created by renewable term contracts of no less than 30 years. This approach creates more opportunities for the in-lieu fee program to respond to emerging threats and target mitigation funds to the areas in which they can be most effective, while ensuring that projects remain long enough in duration to provide expected benefits to the species. Permittees using dynamic permanent credits will be responsible for demonstrating durability for the life of the impact by purchasing or creating additional credits as needed when term credits expire. The ratio of term and permanent credits will be evaluated through the adaptive management process and may need to be adapted in the future.

As a default, compensatory mitigation is strongly preferred on sites that are not part of the site impacted by the development action (i.e., *offsite*) and are large enough to support high-quality sage-grouse habitat. Compensatory mitigation *onsite* (i.e., proximate to impacts) may be considered when habitat at the proposed compensatory mitigation site is identified as a priority area for protection or restoration/enhancement by the state's Oregon Rangelands Decision Support System, and the area proposed for a compensatory mitigation project will not negatively affected by the impact.

In-kind mitigation is the replacement or substitution of resources or values that are of the same type and kind as those replaced. To be considered in-kind, crediting actions should be for the same species (greater sage-grouse) and should occur in or result in ecological states of the same or higher value to sage-grouse (see state and transition models provided in Appendix A) as the area impacted. For example, impacts to a site in the perennial herbaceous state (state B) may be offset by crediting projects in the same state (B) or in a sagebrush-perennial herbaceous state (state A).

⁴⁶ See Interior Mitigation Strategy; *supra* note 6, at p. 6.

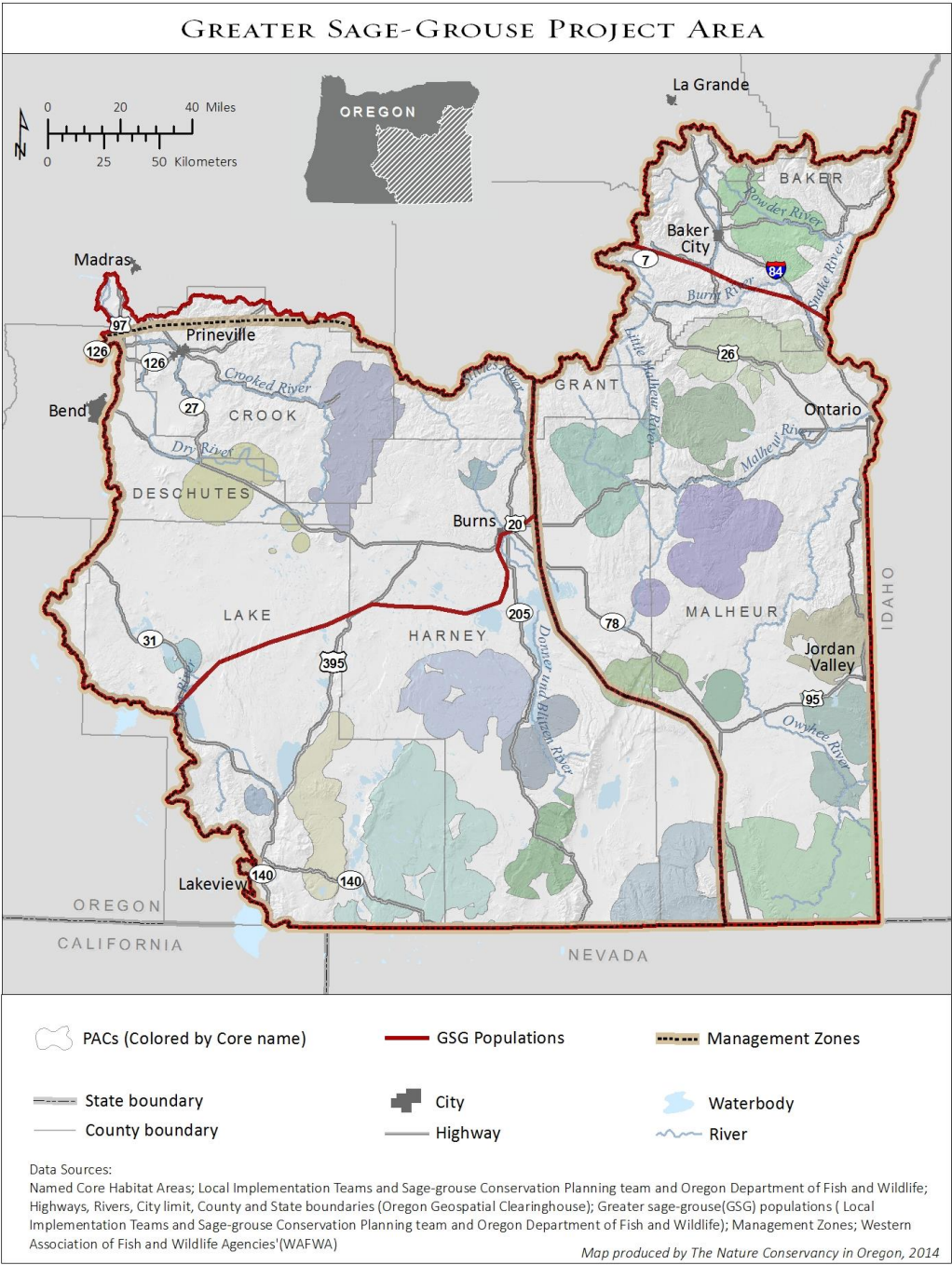
3.4 Purchasing or Creating Credits

The mitigation review team notifies permitting agencies and program administrator when mitigation plan has been finalized and determined consistent (but may be subject to other non-sage-grouse-related agency-specific permitting requirements). The permittee must then purchase the needed credits through the in-lieu fee program or create credits through implementation of permittee-responsible mitigation projects within the designated timeframe. When a permit is issued, or an affected development activity is otherwise approved or funded, the permitting agency reports the proposed development footprint to the program administrator to be entered in the State's development database, to be updated with the actual development footprint when a project is implemented and finalized.

3.5 Ongoing Verification, Tracking, and Adaptive Management

The permittee is responsible for notifying the permitting agency of any changes in projected impacts. Credits that are bought or created but are not required to meet the State's net conservation benefit due to an actual impact being less than anticipated may be purchased by the in-lieu fee fund at the discretion of the program administrator and as funding allows. Permittee-responsible mitigation projects must meet the standards and requirements outlined in Section 4 for all crediting projects, including ongoing protection, stewardship, monitoring, and verification. ■

Figure 3.2 - Map of Service Area Boundaries



4. GOVERNANCE AND ADAPTIVE MANAGEMENT

4.1 Organizational Structure

The organizational structure and interactions between the participants in the mitigation debiting and crediting system are described below. Many participants have additional roles in implementing the GSG Action Plan, outside of the mitigation realm, which are described in the body of the plan document:

Statewide Sage-Grouse Governance Board:

The over-arching statewide governance board, comprised of representatives from key state and federal agencies, local governments, Local Implementation Teams, private landowners, and non-profit organizations, is responsible for directing implementation and adaptive management of the entire GSG Action Plan. Their roles include identifying and addressing statutory, administrative, or regulatory barriers to plan implementation; programmatic recommendations on allocation and coordination of resources (funds and personnel); and coordination with other regional sage-grouse efforts, including BLM and neighboring states. As part of its resource allocation and coordination role, the governance board approves mitigation crediting projects and the allocation of in-lieu fee funds, based on recommendations by the State Technical Team and program administrator. The board also approves changes to the mitigation program identified through the adaptive management process.

State Technical Team: The State Technical Team's role is to provide technical and scientific advice and support for implementation of the entire GSG Action Plan. Within the mitigation program, the State Technical Team provides the following technical support to the board:

- Identifies, synthesizes, and makes recommendations to the governance board regarding siting and management priorities at the state level to help inform funding and implementation of crediting projects;

- Identifies, synthesizes, and updates information on the benefits and risks associated with different management practices and on the results of project- and program-level monitoring to inform changes in eligible practices and crediting protocols;
- Recommends research needed to develop new management practices or improve implementation of existing practices eligible for crediting;
- Reviews and provides the program administrator with technical comments on mitigation proposals associated with complex or large-scale permits or crediting projects to help evaluate consistency with the ODFW Sage-Grouse Habitat Mitigation Policy; and
- Assists with evaluation of program effectiveness and provides recommendations for adaptive management.

Local Implementation Teams: *Local Implementation Teams*, established under the 2011 ODFW GSG Conservation Strategy, identify local-level siting and management opportunities for crediting projects and advise the State Technical Team and governance board on local priorities, issues, and concerns.

Permittees: Permittees are entities that request permission from permitting agencies to conduct development activities that impact sage-grouse habitat and therefore may be required to demonstrate compliance with the ODFW Sage-Grouse Habitat Mitigation Policy as a result of new or existing statutes, regulations, ordinances, and/or formal agreements.

Permitting Agencies: Permitting agencies under this program are agencies that hold the authority to approve or deny permits or project requests, including county governments, Bureau of Land Management, U.S. Fish and Wildlife Service, Oregon Department of Land Conservation and Development, Oregon

Department of Energy (and Oregon Energy Facility Siting Council), Oregon Department of Fish and Wildlife, Oregon Department of State Lands, Oregon Department of Geology and Mineral Industries, Oregon Department of Transportation, Oregon Water Resources Department, Oregon Department of Environmental Quality, and any other government or agency with authority over a permit or project affecting sage-grouse habitat. During the permit review process, these agencies must ensure that permits or projects anticipated to impact sage-grouse habitat are consistent with the ODFW Sage-Grouse Habitat Mitigation Policy. Permitting agencies are given this responsibility by statutes, regulations, ordinances, or formal agreements. Permitting agencies may also incur mitigation responsibilities for development activities that they fund or directly implement, in which case they would also be considered permittees.

Program Administrator (State of Oregon): The State of Oregon serves as the primary administrator of the mitigation program and is responsible for the operation of the debiting and crediting system, including facilitating and overseeing all credit generation and transaction activities.⁴⁷ The mitigation program administrator:

- Ensures consistent application of program processes and rules;
- Requests and reviews proposals for crediting projects based on spatial and management priorities identified by the State Technical Team and Local Implementation Teams;
- Verifies, issues, and registers credits;

⁴⁷ The State of Oregon will assign a lead agency to fill this role. The State of Oregon also anticipates development of an agreement with BLM and U.S. FWS to confirm their participation in the debiting and crediting system in order to appropriately manage sage-grouse populations and habitat across the State. However, the federal agencies will retain discretion in fulfilling their legal mandates and authorities.

- Assesses the accuracy of credit and debit calculations;
- Tracks program outcomes and reports results of the mitigation program to the governance board; and
- Adaptively manages the program.

Some program administration roles may also be assigned to specific State agencies, to private/non-profit entities, or to trained and certified contractors.

Mitigation Review Team: The review team ensures mitigation proposals from debiting projects are consistent with relevant agreements and policies, including the ODFW Sage-Grouse Mitigation Policy. The team consists of a staff lead from the Oregon Department of Fish and Wildlife and all permitting agencies (including local governments) for the project.

In-Lieu Fee Fund Manager (State of Oregon): The State of Oregon will designate a State agency or other qualified entity to function as fund manager for the in-lieu fee program, including collecting compensatory mitigation payments from permittees and providing grants (both advance implementation funds and reimbursement payments) for credits under the program.

Credit Producers: Credit producers include landowners or land managers, organizations, agencies, or other entities that produce, register, and receive payment for credits in the mitigation program, or that conduct permittee-responsible compensatory mitigation.⁴⁸ Credit

⁴⁸ Proposals for permittee-responsible compensatory mitigation projects are submitted to the program administrator and follow the same requirements (including consistency with the ODFW Sage-Grouse Habitat Mitigation Policy) and processes as in-lieu fee program projects, including the processes for review by ODFW, quantification, monitoring, tracking, and other elements outlined in **Section 2**. The State is exploring mechanisms to leverage an appropriate fee on permittee-responsible compensatory mitigation

producers may also be mitigation bank sponsors, such as conservation banking companies, or other types of aggregators, who work with multiple landowners to implement conservation projects, secure performance assurances, and register credits.

Technical Support Providers: The mitigation program creates additional business opportunities for individuals and entities with technical expertise in conservation planning and project design, who understand how to use the program's tools and forms. Technical support providers may be hired by credit producers to help design credit projects, use the credit quantification method to estimate credits or debits, and submit all required materials to the program administrator. If mitigation program responsibilities are delegated to technical support providers, the State of Oregon will develop a formal process and training program to designate or certify a technical support provider as qualified.

4.2 Program Adaptive Management

This Section describes a process for transparent, science-based, and inclusive adaptive management of the Manual, quantification methods, conservation measures information, and other elements of the sage-grouse mitigation program.

In order to ensure the sage-grouse mitigation program is meeting the goals outlined in **Section 1.1** of this document:

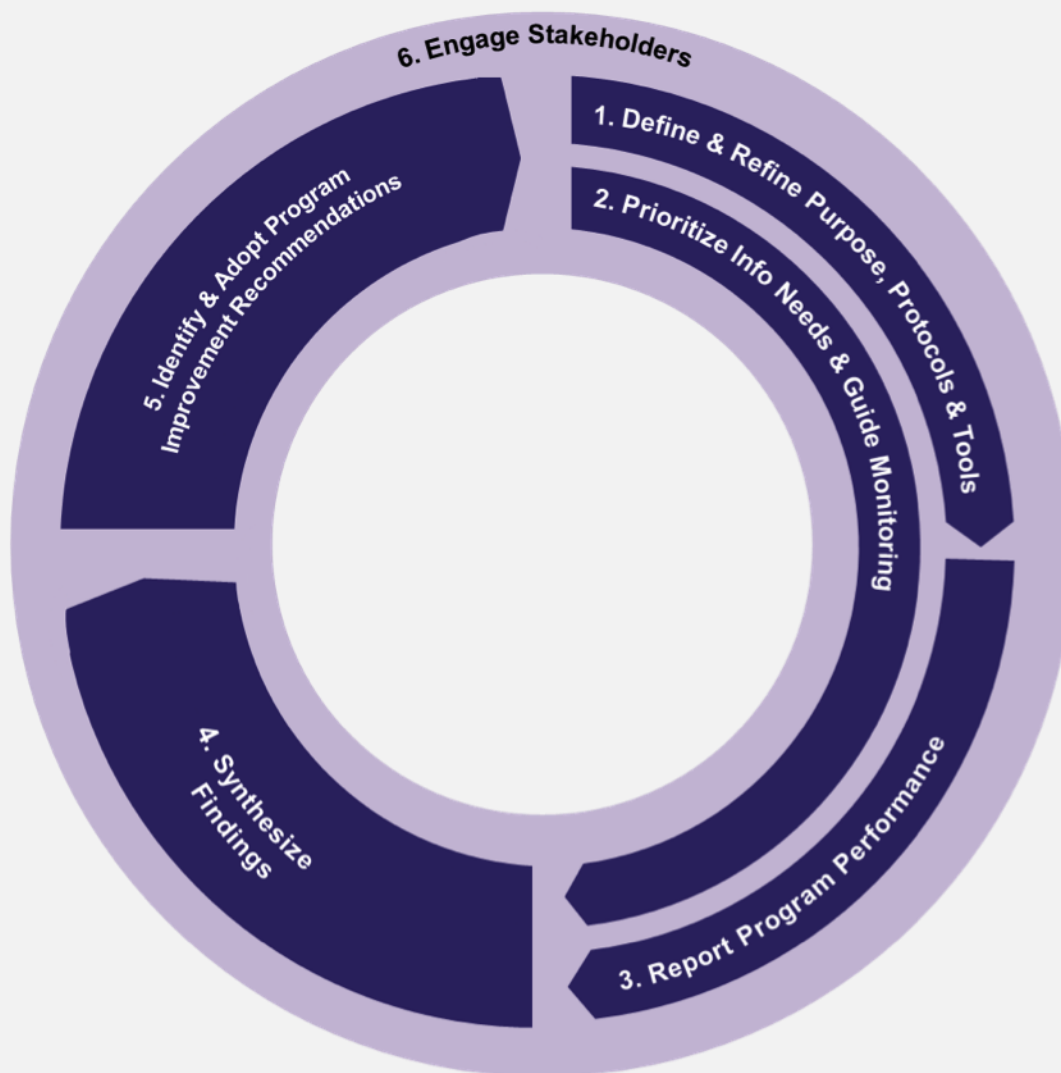
- Within 1 year of the beginning of program implementation, the program administrator should work with the State Technical Team and governance board to **identify measurable objectives and adaptive management “trigger points”** that would indicate changes to the program are needed;

projects to cover their participation in the program and all associated administrative costs.

- On an annual basis, the program administrator (with support of the State Technical Team) will **conduct an adaptive management review**, assessing whether the program is meeting goals and objectives, including:
 - A report of program performance, including a synthesis of monitoring and tracking of pre-project and post-project conditions for both crediting and debiting projects;
 - A quantification of the net conservation benefit provided by the program in terms of functional habitat acres;
 - A list of recommended changes to the Manual and associated documents, processes, and tools needed to meet (or continue to meet) program goals and objectives; and
 - A prioritized list of monitoring and research needs for better guiding mitigation efforts, developed in collaboration with the State Technical Team, Local Implementation Team, and other stakeholders.
- On an annual basis, the governance board will **evaluate the adaptive management review** and assess whether trigger points or other indicators suggest major changes to the approach are needed; and

- The governance board will **host an annual adaptive management meeting**, open to the public, to share the results of the adaptive management review, share suggested changes to the program, processes, or tools, and receive stakeholder feedback. Changes deemed to be necessary or beneficial should be adopted at that meeting and released as part of a publicly-available report.

Figure 4.1 - Overview of Annual Program Adaptive Management Cycle



5. GLOSSARY

Adaptive Management: A systematic approach for improving natural resource management, with an emphasis on learning from management outcomes and incorporating what is learned into ongoing management.⁴⁹

Additionality: The requirement that credit-generating benefits from a project must be in addition to what would have happened without participation in the mitigation program and what is required by existing law and legal commitments. Habitat functionality improvements that represent an overall increase in, or avoided reduction of, habitat functionality, relative to the habitat functionality that would occur in the absence of a credit-generating project performed in accordance with this Manual.

Affected Development Activity: Actions that are subject to avoidance, minimization, and compensatory mitigation requirements for impacts to sage-grouse habitat under new and existing statutes, regulations, ordinances, and/or formal agreements, because they; negatively impact sage-grouse habitat and create spatially discrete and measurable impacts; are identified as threats in the U.S. Fish and Wildlife Service's Conservation Opportunities Report (COT)⁵⁰; and are authorized, funded, or carried out by federal, state, and local agencies.⁵¹

Assessment Area: The area associated with a project's potential impact/uplift. This defines the boundaries of the calculation of debits or credits.

Baseline: A minimum level of management that must be in place before additional practices may be eligible to earn credits. Typically, BMPs required by applicable federal, state, local, or tribal regulations, CCAAs, or other contracts or binding agreements.

Certification: The formal application and approval process of the credits generated from a conservation measure. Certification occurs after verification.

Compensatory Mitigation: The preservation, enhancement, or restoration of habitat to compensate for unavoidable adverse impacts to the same type of habitat elsewhere.

Connectivity Corridor: "Estimated seasonal use and migratory connections between lek density strata as estimated using a kernel density function. Local corridors were delineated by 75% utilization and seasonal corridors were identified as 90% utilization."⁵²

Conservation Measures: Actions that preserve, enhance, restore, and/or avoid the likely future loss of GSG habitat functionality by reducing or eliminating threats to that habitat.

Core Area Habitat: Habitats "necessary to conserve 90% of Oregon's greater sage-grouse population with emphasis on highest density and important use areas which provide for breeding, wintering and connectivity corridors."⁵³ Criteria to determine core area habitat include lek density, connectivity corridors, and winter habitat-use polygons.

Credit: Quantified, verified, and tradable unit of environmental benefit from a conservation or restoration action above and beyond

⁴⁹ See U.S. Dep't of Interior, Adaptive Management: The U.S. Department of the Interior Technical Guide, 1 (2007, updated 2009), *available at* <http://www.usgs.gov/sdc/doc/DOI-%20Adaptive%20ManagementTechGuide.pdf>.

⁵⁰ COT Report, *supra* note 3.

⁵¹ Local agencies include government bodies or entities.

⁵² 2011 ODFW GSG Conservation Strategy, *supra* note 11, at p. 141.

⁵³ OAR 635-140-0015(1)(a).

baseline requirements. Described as functional acres of habitat provided at a specified location, as adjusted by any trading ratios or reserve requirements.

Credit Producer: An individual, entity, or group generating credits as mitigation for impacts to sage-grouse habitat, whether that entity is the permittee, a contractor of the permittee that develops or aggregates credits, or a landowner or other entity creating credits to sell to the in lieu fee program.

Debits: Quantified and verified units of environmental impact, calculated as the difference between the functional scores of the pre-project and anticipated post-project conditions; based on the same quantification tool used to calculate credits.

Disturbance Threshold: A threshold set in state policy to limit development in core sage-grouse habitat implemented through land use planning and inter-agency agreements.

Durable: See Project Durability.

Dynamic Permanent Mitigation: Mitigation achieved by the use of Credits produced in a series of term agreements, such that the quantity and quality of the mitigation is permanent in duration.

Effectiveness Monitoring: Systematic data collection and analysis to determine progress of a natural resource management program toward the achievement of conservation goals. Effectiveness monitoring provides the basis for adaptive management.

Eligible Conservation Measures: Actions that preserve, enhance, restore, or avoid the likely future loss of habitat functionality and that meet requirements for offsetting impacts to sage-grouse habitat created by affected development activities.

Financial Management Plan: Prepared for each mitigation project and includes initial costs (acquisition, field surveys, habitat restoration, capital equipment, etc.), on-going annual costs (monitoring, maintenance, management, reporting, contingency allocation, etc.), and endowment requirements, accounting for inflation and investment strategy.

Force Majeure: Extraordinary events or circumstances beyond the control of the individuals or entities in the credit transaction, including acts of God such as natural disasters.

Functional Acre: The single unit of value that expresses the assessment of quantity (acreage) and quality (function) of habitat or projected habitat through the quantification of a set of local and landscape conditions.

General Habitat: Occupied (seasonal or year-round) sage-grouse habitat outside of core area or priority habitat⁵⁴

In-Kind Mitigation: Designed to replace lost resources with identical or very similar resources.

In-Lieu Fee: A site established as part of an in-lieu fee program that provides ecological functions and services expressed as credits that are conserved and managed for specific species and are used to offset impacts occurring elsewhere to the same species. In-lieu fee programs are sponsored by government agencies or environmental not-for-profit organizations that collect funds that are used to establish in-lieu fee sites. The establishment, operation, and use of an in-lieu fee program requires an agreement between the regulating agency and the in-lieu fee sponsor.

Indirect Effects (Impacts): Effects that are caused by or will ultimately result from an affected development activity. Indirect effects usually occur later in time or are removed in distance compared to direct effects.

Landscape Scale: A large area encompassing an interacting mosaic of ecosystems and human systems that is characterized by a set of common management concerns. The landscape is not

⁵⁴ Bureau of Land Management, *Oregon Sub-Region Greater Sage-Grouse Draft Resource Management Plan Amendment and Environmental Impact Statement, Volume II*, p. 8-16 (November 2013) (hereafter "BLM Draft RMP").

defined by the size of the area, but rather by the interacting elements that are meaningful to the management objectives.⁵⁵

Lek: An open area in which male sage-grouse perform courtship displays. Leks are commonly areas of bare soil, short grass steppe, windswept ridges, and exposed knolls that are surrounded by denser shrub steppe cover. Leks are indicative of nesting habitat.⁵⁶

Local Implementation Teams: Guide the implementation of sage-grouse and sagebrush conservation actions at the local level; comprised of land managers, county governments, ODFW, and landowners. The teams are organized by BLM district boundaries.⁵⁷

Low Density Habitat: A term used in the 2011 ODFW GSG Conservation Strategy that generally refers to sage-grouse habitats outside of core area habitats that provide breeding, summer, and migratory habitats for Oregon sage-grouse populations⁵⁸

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.”⁵⁹ Thus, mitigation encompasses the full suite of activities to avoid, minimize, and compensate for adverse impacts to sage-grouse and sage-grouse habitat.

Mitigation Hierarchy: Refers to the analysis and actions required by ODFW (Oregon Administrative Rule 635-415-0005) and USFWS (46 Federal Register 7656).⁶⁰ See Mitigation Sequencing.

Mitigation Agreement: A formal agreement between credit producers and the mitigation program administrator establishing liability, performance standards, management and monitoring requirements, and the terms of credit approval. The agreement includes the required attachments, including the site-specific plan, financial management plan, stewardship plan, permanent legal protection documents, and verification report.

Mitigation Plan: A written plan or statement that thoroughly describes a development action, the affected environment, expected impacts to sage-grouse habitat, and the manner in which the impacts of a development action will be avoided, minimized, reduced or eliminated over time, and/or compensated for.⁶¹

Mitigation Project: Conservation measures taken by an entity on a project site.

Mitigation Review Team: A team of staff members from ODFW and each of the relevant permitting agencies, convened on an ad hoc basis to review and evaluate the mitigation proposal associated with a specific development action impacting sage-grouse habitat. Guidelines for convening and operating a mitigation review team, including a

⁵⁵ Interior Mitigation Strategy, *supra* note 6, at p. 9.

⁵⁶ GSG *Species Assessment*. For a description of types and categories of leks, see 2011 ODFW GSG Conservation Strategy, *supra* note 11, at pp. 142-143.

⁵⁷ 2011 ODFW GSG Conservation Strategy, *supra* note 11, at p. 98, 126-131.

⁵⁸ 2011 ODFW GSG Conservation Strategy, *supra* note 11, at p. 82-83.

⁵⁹ BLM Draft RMP, *supra* note 53, at p. 8-23.

⁶⁰ See also Interior Mitigation Strategy, *supra* note 6, at p. 2-3.

⁶¹ See OAR 635-415-0005(18), 0020(5), & 0020(8)-(10).

process for timely dispute resolution, will be outlined in an interagency agreement.

Mitigation Sequencing: The process of first avoiding impacts to ecosystems, then minimizing, and finally allowing for compensatory mitigation in the case of unavoidable impacts. The purpose of sequencing is to analyze all reasonable options to first avoid and minimize impacts before allowing impacts that require compensatory mitigation – especially for important ecological areas and functions. See Mitigation Hierarchy.

Monitoring: The process of observing and recording environmental conditions and changes in environmental conditions over space and time.

Net Conservation Benefit: The actual benefit or gain above baseline conditions, after deductions for impacts, in habitat function or value to species covered by a mitigation program.

Offset: The act of fully compensating for environmental impacts; accomplished through compensatory mitigation.

Offsite: Outside the development project site or area; refers to mitigation.

Onsite: On or proximate to the development project site; refers to mitigation.

Permanent Legal Protection: The enforceable agreements to protect conservation benefits provided at a mitigation project site, which may include leases, contracts, easements, or other agreements. Project protection agreements must cover the credit life and should run with the land to ensure the project will not be affected if ownership changes. Ideally, these protections will also mitigate against proximate disturbing land use activities.

Permittee: An individual, entity, or group seeking to implement an affected development activity.

Permittee-Responsible Compensatory Mitigation: A compensatory mitigation site that provides ecological functions and services established as part of the

conservation measures associated with a permittee's action. The permittee retains responsibility for ensuring that the required compensatory mitigation activities are completed and successful. Each permittee-responsible compensatory mitigation site is linked to the specific activity that required the offset. Permittee-responsible compensatory mitigation approved for a specific action is not transferable and cannot be used for other mitigation needs.

Permitting Agencies: Agencies that fund or issue permits for development projects that may impact sage-grouse habitat, including county governments, the State of Oregon, the Bureau of Land Management, or other permitting agencies.

Phased Release of Credits: Releasing a limited number of credits from a project in stages prior to its completion for the purpose of balancing the time delay in realizing the ecological benefits of a project with the need for up-front funds to finance implementation measures.

Priority Areas for Conservation (PACs): Key habitats identified by state sage-grouse conservation plans or through other sage-grouse conservation efforts (e.g., BLM planning). In Oregon, core area habitats are PACs. According to the COT Report, maintenance of the integrity of PACs is the essential foundation for sage-grouse conservation.⁶²

Priority Sage-Grouse Habitat: Areas identified by BLM as having the highest conservation value to maintaining sustainable sage-grouse populations. Include breeding, late brood-rearing, and winter concentration areas⁶³

Program Administrator: The agency or other entity responsible for the operation of the debiting and crediting system, including

⁶² COT Report, *supra* note 3, at p. 36.

⁶³ BLM Draft RMP, *supra* note 53, at p. 8-28.

facilitating and overseeing all credit generation and transaction activities.

Project Closure Date: Five years after the last credit from a mitigation agreement has been sold.

Project Durability: Refers to the requirement that mitigation must be effective for as long as the impacts being mitigated for last. Because impacts to sage-grouse habitat by debiting projects are assumed to be permanent unless demonstrated to be temporary by the permittee (see Section 2), it is anticipated that most crediting projects will need to include permanent legal protection and a non-wasting endowment to manage the site into the future.

Project Life: The period of time over which a conservation measure is expected to generate credits. Typically, the project life is also the minimum project protection period.

Project Site (Project or Site): The location at which conservation measures or affected development activities are undertaken or installed.

Quantification Method: Scientifically-based method for determining the conservation benefit associated with a given credit-generating activity.

Registering of Credits: The process of placing a verified and certified credit into the registry; includes the required documentation.

Registry: A service or software that provides a ledger function for tracking credit quantities and ownership. Credit registries may also act as a mechanism for public disclosure of trading project documentation.

Regulatory Requirements: See Baseline.

Reserve Pool: A pool of credits, funded by a percentage of the credits transferred in each transaction, that are used to cover shortfalls when credits that have been generated and sold are invalidated due to fire, extreme weather, invasion by exotic species, breach of a project contract, or other unforeseen events. The reserve pool helps to ensure that a net positive amount of credits exist.

Retirement ratio: A ratio applied to the estimated credits which sets aside a portion of credits for net environmental benefit.

Sage-Grouse Habitat: Sagebrush or potential sagebrush habitat within the distribution of current occupied habitat as defined and mapped in the 2011 ODFW GSG Conservation Strategy

Service Area: (1) The geographic region relevant for tracking debits and credits to sage-grouse habitat. (2) The geographic region within which a developer must conduct permittee-responsible compensatory mitigation.

Site-Specific Plan (SSP): Identifies the extent, type, and description of all proposed conservation measures. Individual SSPs will describe:

- The type and location of ecological states present on the project site;
- Current and future threats to sage-grouse habitat function for the site; and
- Specific conservation practices that will be implemented on the site to maintain or improve habitat for the species.

Stewardship Plan: Identifies a long-term steward of a development project, stewardship goals and activities, the amount and source of funds needed for an endowment to maintain the site for the duration of the project life, and documentation of the time needed to implement the full stewardship plan.

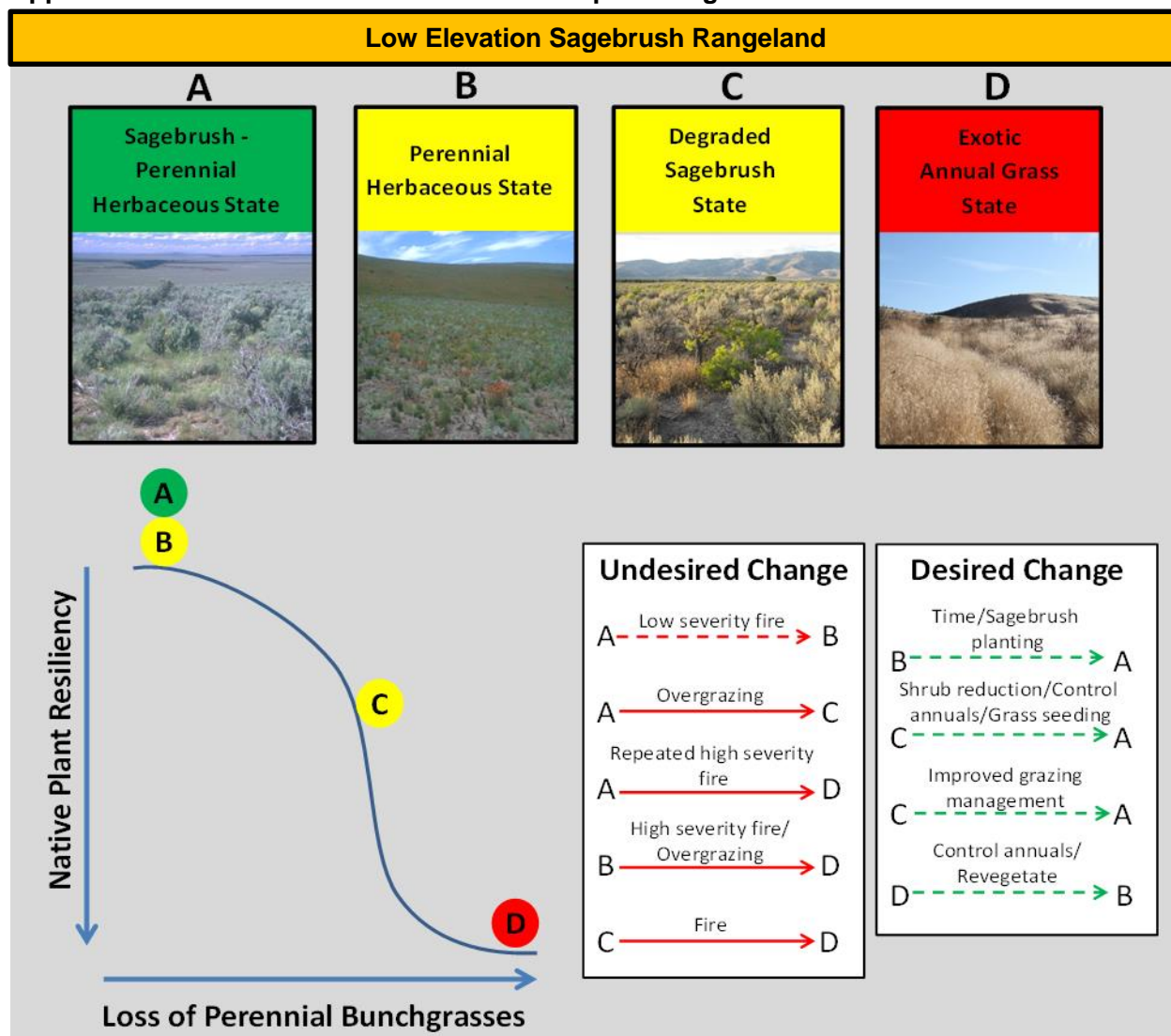
Uncertainty: Refers to the inability to obtain knowledge about factors that may negatively impact mitigation projects. Types of uncertainty include ecological risk (e.g., wildfires and invasive species), management risk (e.g., bankruptcy and project implementation or maintenance failure), and regulatory risk (e.g., revised laws or regulations).

Verification: An independent, expert check on the credit estimate, processes, services, or documents provided by a project developer. The purpose of verification is to provide confidence to all program participants that

credit calculations and project documentation
are a faithful, true, and fair account – free of

material misstatement and conforming to
credit generation and accounting standards

Appendix A. State-and-Transition Models for Upland Sage-Grouse Habitat⁶⁴



Conceptual ecological framework for managing sage-grouse habitat using a generalized state-and-transition model for **low elevation sagebrush plant communities in Oregon with warm and dry or cool and dry soil temperature/moisture regimes** (Miller et al. 2013). Resiliency will be lower for communities on warm and dry sites. States (top) shaded in green indicate potential year-round habitat suitability for sage-grouse. States in shaded yellow and red indicate potential seasonal habitat and non-habitat, respectively. “Native plant resiliency” (lower left) indicates the relative likelihood of a plant community to recover to a native plant-dominated state following disturbance and decreases with loss of large perennial bunchgrasses. Persistent transitions (lower right) between states are depicted with solid arrows, while non-persistent transitions are arrows with dotted lines.

⁶⁴ Models provided by the authors of Boyd, Chad S., Johnson, Dustin D., Kerby, Jay D., Svejcar, Tony J., & Davies, Kirk W., Of Grouse and Golden Eggs: Can Ecosystems Be Managed Within a Species-Based Regulatory Framework?, RANGELAND ECOLOGY & MANAGEMENT 67: 358-368 (2014).

Low Elevation Sagebrush Rangeland

Ecological State A

Site dominated by sagebrush, large perennial bunchgrasses, and perennial forbs. Sagebrush cover >10%. Capable of providing year around habitat for sage-grouse.



Ecological State B

Site dominated by large perennial bunchgrasses and perennial forbs. Sagebrush cover <10%. Capable of providing seasonal habitat for sage-grouse.



Ecological State C

Site dominated by decadent sagebrush and Sandberg bluegrass and/or annual grasses. Sagebrush cover > 10%. Capable of providing seasonal habitat.



Ecological State D

Site dominated by exotic species. Often results in exotic annual grass-fire cycle. Not capable of providing habitat for sage-grouse in current state.



Conservation Objectives

Prevent conversion to exotic annual grasses by maintaining dominance of large, deep-rooted perennial bunchgrasses and sagebrush. Manage for stable or improving trend.

Conservation Objectives

Prevent conversion to exotic annual grasses by maintaining dominance of large, deep-rooted perennial bunchgrass and provide conditions for reestablishment of sagebrush. Manage for transition toward State A.

Conservation Objectives

Maintain a dominant overstory layer of sagebrush and reestablish deep-rooted perennial vegetation. Experimentation with various methods for reestablishment might be necessary to cause desirable shift in vegetation.

Conservation Objectives

Despite being in a non- habitat state currently, conservation objectives are suggested because of the inherent risks posed by exotic plant presence on the landscape. Man-age fire risk and/or re-vegetate areas of exotic plants to veg dominated by deep-

Threats

Wildfire
Improper grazing
Exotic Invasives

Threats

Wildfire
Improper Grazing
Exotic Invasives
Vegetative Treatment

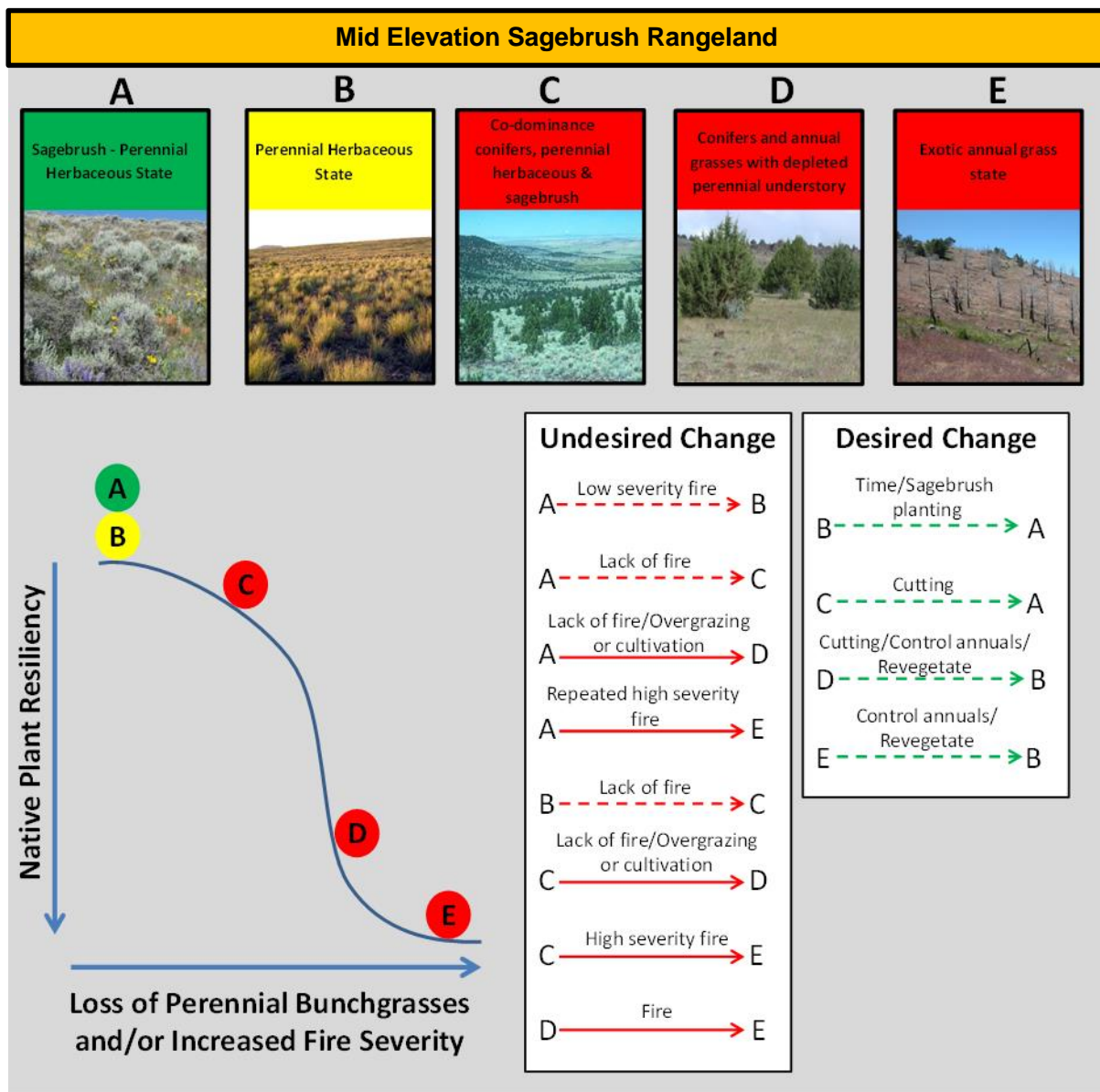
Threats

Wildfire
Improper Grazing
Exotic Invasives






Threats

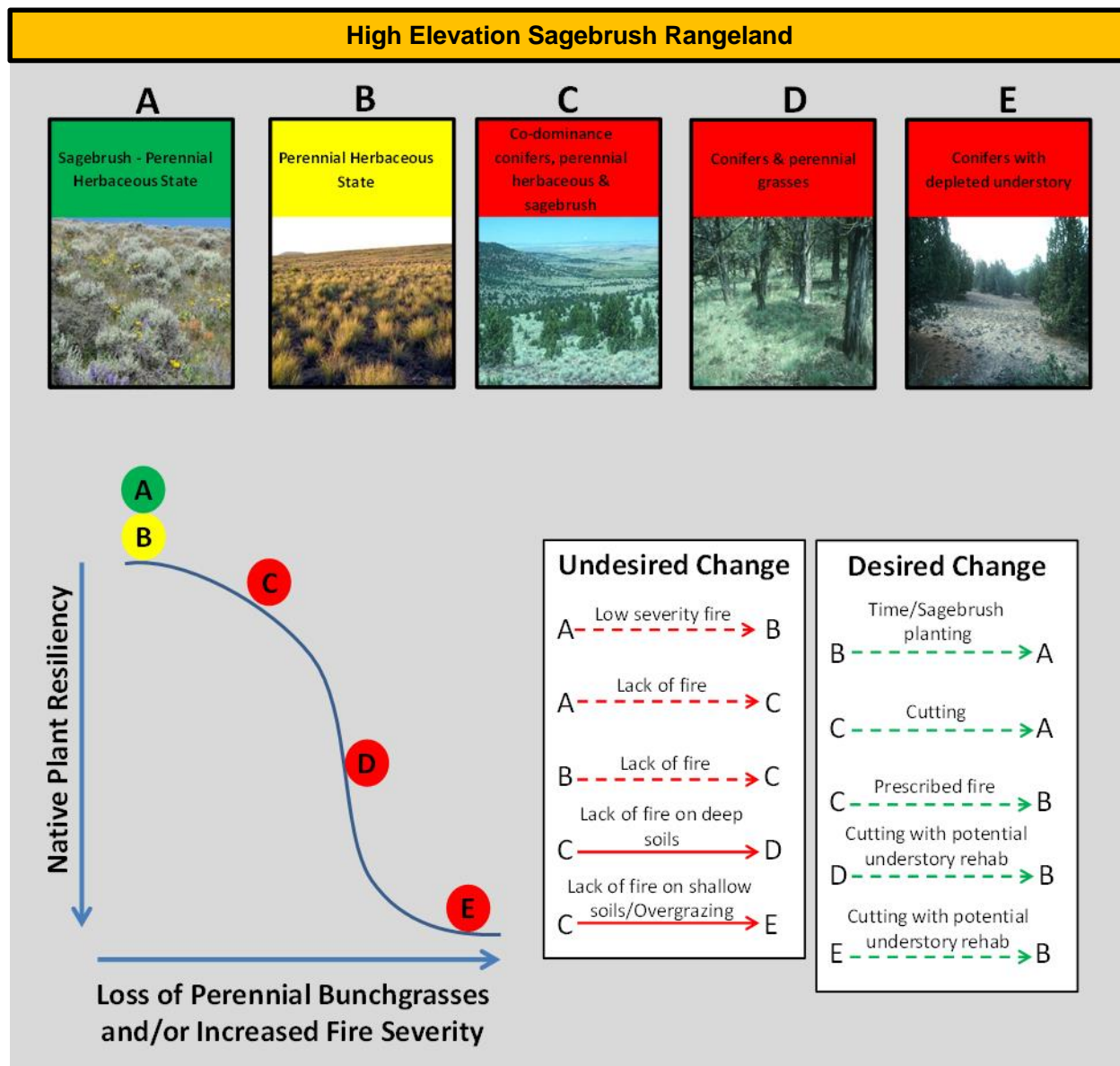
Wildfire
Exotic Invasives
Vegetative Treatment

See Appendix B for applicable conservation measures








Conceptual ecological framework for managing sage-grouse habitat using a generalized state-and-transition model for **mid to high elevation sagebrush plant communities in Oregon with a warm and moist soil temperature/moisture regime** (Miller et al. 2013) in Oregon. States (top) shaded in green indicate potential year-round habitat suitability for sage-grouse. States in shaded yellow and red indicate potential seasonal habitat and non-habitat, respectively. “Native plant resiliency” (lower left) indicates the relative likelihood of a plant community to recover to a native plant-dominated state following disturbance and decreases with loss of large perennial bunchgrasses and increasing fire severity. States with increased woody plant fuel loading (e.g. D) can be less likely to burn due to decreased fine fuel loading, but more likely to experience higher severity fire when they do burn (Miller et al. 2008). Persistent transitions (lower right) between states are depicted with solid arrows, while non-persistent transitions are arrows with dotted lines. Warm and dry sites often occur at the same elevation as cool and moist conditions, with differences being driving largely by aspect or other abiotic factors. Prescribed fire is depicted as a management option for reducing conifers on cool and moist sites, but not warm and dry sites, due to the potential for transition to annual grass dominance with fire in the latter.

Mid Elevation Sagebrush Rangeland				
Ecological State A Site dominated by sagebrush, large perennial bunchgrasses, and perennial forbs. Sagebrush cover >10%. Capable of providing year around habitat. 	Ecological State B Site dominated by large perennial bunchgrasses and perennial forbs. Sagebrush cover <10%. Capable of providing seasonal habitat. 	Ecological State C Co-dominance of conifers, perennial grasses and sagebrush. Areas of conifer cover >5% not capable of providing seasonal habitat. 	Ecological State D Site dominated by conifers. Depleted perennial understory. Exotica annuals present. Not capable of providing habitat in current state. 	Ecological State E Site dominated by exotic species. Often results in exotic annual grass-fire cycle. Not capable of providing habitat for sage-grouse in current state. 
Conservation Objectives Maintain sagebrush and large perennial bunchgrasses and perennial forbs. Maintain sagebrush cover >10%.	Conservation Objectives Provide conditions for an increase in the cover of sagebrush. Manage for transition toward State A.	Conservation Objectives Restore shrubs and perennial herbaceous vegetation by removing conifers and post treatment restoration of desired species.	Conservation Objectives Restore dominance of shrub and perennial grasses and forbs through removal of dominant conifer overstory and reveg.	Conservation Objectives Manage fire risk and/or revegetate areas of exotic plants to vegetation dominated by deep-rooted perennial
Threats Lack of fire High severity fire Improper grazing Conifer encroachment	Threats High severity fire Improper grazing Conifer encroachment	Threats High severity fire Improper grazing Exotic Invasives Conifer encroachment	Threats Wildfire Exotic Invasives	Threats Wildfire Exotic Invasives
See Appendix B for applicable conservation measures				



Conceptual ecological framework for managing sage-grouse habitat using a generalized state-and-transition model for **high elevation sagebrush plant communities in Oregon with a warm/cool and moist soil temperature/moisture regime** (Miller et al. 2013) in Oregon. States (top) shaded in green indicate potential year-round habitat suitability for sage-grouse. States in shaded yellow and red indicate potential seasonal habitat and non-habitat, respectively. “Native plant resiliency” (lower left) indicates the relative likelihood of a plant community to recover to a native plant-dominated state following disturbance and decreases with loss of large perennial bunchgrasses and increasing fire severity. States with increased woody plant fuel loading (e.g. D and E) can be less likely to burn due to decreased fine fuel loading, but more likely to experience higher severity fire when they do burn (Miller et al. 2008). Persistent transitions (lower right) between states are depicted with solid arrows, while non-persistent transitions are arrows with dotted lines.

High Elevation Sagebrush Rangeland

Ecological State A	Ecological State B	Ecological State C	Ecological State D	Ecological State E
<p>Site dominated by sagebrush, large perennial bunch-grasses, and perennial forbs. Sagebrush cover >10%. Capable of providing year around habitat.</p> 	<p>Site dominated by large perennial bunchgrasses and perennial forbs. Sagebrush cover <10%. Capable of providing seasonal habitat.</p> 	<p>Co-dominance of conifers, perennial grasses and sagebrush. Areas of conifer cover >5% not capable of providing seasonal habitat.</p> 	<p>Site over shallow soils dominated by conifers. Shrubs and herbaceous understory largely absent. Not capable of providing habitat in current state.</p> 	<p>Site over deep soils dominated by conifers. Understory shrubs largely absent. Perennial herbaceous plant present. Not capable of providing habitat in current state.</p> 
<p>Conservation Objectives</p> <p>Maintain sagebrush and large perennial bunchgrasses and perennial forbs. Maintain sagebrush cover >10%.</p>	<p>Conservation Objectives</p> <p>Provide conditions for an increase in the cover of sagebrush. Manage for transition toward State A.</p>	<p>Conservation Objectives</p> <p>Remove conifers and prevent further encroachment and maintain cover of perennial grass and sagebrush</p>	<p>Conservation Objectives</p> <p>Restore dominance of shrub and perennial grasses and forbs through removal of dominant conifer overstory.</p>	<p>Conservation Objectives</p> <p>Restore shrubs and perennial herbaceous vegetation by removing of conifers and post treatment restoration of desired species.</p>
<p>Threats</p> <p>Lack of fire Improper grazing Conifer encroachment</p>	<p>Threats</p> <p>Lack of fire Improper grazing Conifer encroachment</p>	<p>Threats</p> <p>Lack of fire Improper grazing Conifer encroachment Exotic Invasives</p>	<p>Threats</p> <p>Lack of fire Exotic Invasives</p>	<p>Threats</p> <p>Lack of fire Exotic Invasives</p>
<p style="text-align: center;">See Appendix B for applicable conservation measures</p>				

Appendix B: Eligible Conservation Measures (WORKING DRAFT)⁶⁵

Table B.1: Enhancement measures

Practices to Change to Desirable States												
STM	Initial State	Desired state outcome	Practices to Implement	Uncertainty	Risk	Likelihood of state change	Time to state change	Duration of benefit/treatment	Avoided loss (sage-grouse habitat)	Measure of Success	Cost	Comments
Low elevation sagebrush rangeland	B	A	Time/ Sagebrush transplanting	M	Wildfire	M	Long	Long	N/A	Increase shrub cover	\$\$	Poorest success of three types of sites
	C	A	Shrub reduction/Control annuals/Revegetate	H	Moving to state D	M	Moderate	Long	H	Increase perennial bunchgrass density	\$	High uncertainty, difficult to protect from fire
	C	A	Improve grazing management of desired plants	M	Wildfire	M	Moderate-Long	Long	H	Increase perennial bunchgrass density	\$	Reducing grazing pressure may mean more fuel
	D	B	Control annuals/ Revegetate with natives	L		L	Moderate	Long	N/A, D is non-habitat	Increase perennial bunchgrass density	\$\$\$	High uncertainty, native seeding success is reliably poor, may include prescribed fire for site prep; drill seeding improves probability
	D	B	Control annuals/Revegetate using introduced species such as Crested Wheatgrass	L	Wildfire	M	Moderate	Long	N/A, D is non-habitat	Increase perennial bunchgrass density	\$\$	Crested wheatgrass seeding success is more reliable, may include prescribed fire for site prep
	B	A	Protect from high severity wildfire (fuel breaks)	H	Wildfire	M	Long	Long	M	Increase shrub cover	\$	High uncertainty, difficult to protect from fire

⁶⁵ Subject to ongoing revision and developed and provided by the SageSHARE project team.

Practices to Change to Desirable States												
STM	Initial State	Desired state outcome	Practices to Implement	Uncertainty	Risk	Likelihood of state change	Time to state change	Duration of benefit/treatment	Avoided loss (sage-grouse habitat)	Measure of success	Cost	Comments
Mid elevation Sagebrush Rangeland	B	A	Time, Sagebrush planting	M		H	Moderate	Long	N/A	Increase shrub cover	\$\$	Intermediate success of sagebrush seeding
	B	A	Time, Protect from wildfire	L	Conversion to C	H	Moderate	Long	M	Increase shrub cover	\$	
	C	A	Cutting/ Mechanical juniper removal	L		H	Immediate	Moderate	N/A, non-habitat as C	Decrease Juniper density/cover	\$\$	Sagebrush usually responds quickly to release from juniper competition
	D	B	Cutting/Mechanical juniper removal/ Revegetate understory	M	Conversion to E	M	Moderate	Moderate	N/A, non-habitat as D	Decrease Juniper density/cover & Increase perennial bunchgrass cover	\$\$\$	Consider partial juniper removal initially to gauge understory response
	E or D	B	Cutting/ Mechanical juniper removal/ Control annuals/ Revegetate with native perennial species	H	No perennial grass recovery	L-M	Moderate	Moderate	N/A, non-habitat as D	Increase perennial bunchgrass density	\$\$\$	Lengthy process with multiple steps
	E or D	B	Cutting/Mechanical juniper removal/ Control annuals/ Revegetate with introduced perennial species such as crested wheatgrass	L	No perennial grass recovery	M-H	Moderate	Moderate	N/A, non-habitat as D	Increase perennial bunchgrass density	\$\$	Fire risk reduction strategy

Practices to Change to Desirable States												
STM	Initial State	Desired state outcome	Practices to Implement	Uncertainty	Risk	Likelihood of state change	Time to state change	Duration of benefit/treatment	Avoided loss (sage-grouse habitat)	Measure of Success	Cost	Comments
High elevation Sagebrush Rangeland	B	A	Sagebrush seeding	L		M	Moderate	Long	N/A	Increase shrub cover	\$\$	Success much higher here than in mid and especially low elevation sites
	B	A	Time/ Potect from fire	L	Increase in Juniper cover	H	Moderate - long	Long	N/A	Increase shrub cover	\$	Success depends on seed bank and proximity to seed sources
	C	A	Prescribed fire with mosaic effects	L	Decrease shrub cover	H	Immediate	Moderate	avoided loss (sage-grouse habitat)	Decreased juniper, increase mosaic habitats	\$\$	Mosaic burn maintains seed source for sagebrush in unburned islands
	C	B	Prescribed fire with homogenous effects	L	Decrease shrub cover	H	Immediate	Long	N/A, non-habitat as C	Decreased juniper	\$\$	
	C	A	Cutting/ Mechanical juniper removal	L		H	Immediate	Short - moderate	N/A, non-habitat as C	Decreased juniper	\$\$	Moderate cost, but if understory is intact this is a low risk treatment
	D	B	Prescribed fire	M		M	Immediate	Long	N/A, non-habitat as D	Decreased juniper	\$\$	Depends on percent juniper kill and burn coverage
	D	B	Cutting/ Mechanical juniper removal / Understory restoration	L		H	Immediate	Short-moderate	N/A, non-habitat as D	Decreased juniper	\$\$\$	
	E	B	Cutting/ Mechanical juniper removal / Understory restoration	M		M	Moderate - long	Short-moderate	N/A, non-habitat as E	Decreased juniper	\$\$\$	depends on pretreat BG density

Table B.2: Avoided Loss Measures

Practices to Maintain Desired Plant Community - State A						
Practices List	Uncertainty	Risk	Avoided Loss	Measure Success	Cost	Comments
Limit intense and/ or frequent disturbances and/ or stress to desired plants, this can include prescribed grazing practices; low intensity fire; limited equipment use	L	L		Maintenance of desired vegetation, shrub cover, perennial bunchgrass density &/ or cover	\$	Disturbances generally favor undesirable community changes any practice to minimize the intensity or frequency of disturbances will favor desired plants
Create prevention program: Map and delineate priority zones; Identify corridors of spread; action plan for early detection & rapid response and for eradicating infestations Create fuel break if weed infestations are adjacent to desired community	M	L		Maintenance of desired vegetation, shrub cover, perennial bunchgrass density &/ or cover	\$ to \$\$\$	Comprehensive prevention program ideas are available in the user guide: Establishing a Weed Prevention Area
Increase seed production and dispersal of desired plants	M	L		Maintenance of desired vegetation, shrub cover, perennial bunchgrass density &/ or cover	\$	
Limit resource availability by keeping nutrients conserved in desired plants	M	M		Maintenance of desired vegetation, shrub cover, perennial bunchgrass density &/ or cover	\$	
Maintain or increase perennial bunchgrass to reduce invasion potential	M	L		Maintenance of desired	\$\$	