Owyhee River Group 1 Allotments Livestock Grazing Permit Renewal Environmental Assessment

Idaho BLM NEPA Permit Renewal Team
January 2013

Owyhee Field Office

BLM

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

Bureau of Land Management
EA No. DOI-BLM-ID-B030-2012-0012-EA

Table of Contents

1 INTRODUCTION

1.1 Title

Owyhee River Group 1 Allotments Livestock Grazing Permit Renewal Environmental Assessment

1.2 Name and Location of Preparing Office

Bureau of Land Management
Idaho State Office
1387 S. Vinnell Way
Boise, ID 83709

1.3 Background

This Environmental Assessment (EA) has been prepared to analyze the impacts of renewing livestock grazing permits for a term of 10 years on four allotments in Owyhee County, Idaho: Castlehead-Lambert, Garat, Swisher Springs, and Swisher Fenced Federal Range (FFR) (Map GEN-1).

The BLM Owyhee Field Office has prioritized and grouped allotments to fully process and renew grazing permits in accordance with the Order Approving Stipulated Settlement Agreement (United States District Court for the District of Idaho Case 1:97-CV-00519-BLW) dated June 26, 2008. The agreement defined a schedule for completing the required environmental analyses and to issue final decisions and grazing permits for a number of allotments.

The four Owyhee River Group allotments in this EA, which are under the purview of the Owyhee Field Office, are located adjacent to one another within the southern portion of Owyhee County, Idaho. Applications for renewal of grazing permits for use in these four allotments have been received by BLM from permittees who are currently authorized to graze livestock in these allotments.

The Collins Ranch, LLC, submitted an application dated June 29, 2011, and the 06 Livestock Company submitted an application dated August 11, 2011, to renew permits to graze livestock on the Castlehead-Lambert allotment. Both of these applications were revised, as identified in a document dated December 12, 2011 and titled “Permittee Proposed Adaptive Management Concept” (Appendix E). Transfer of the grazing permit held by Collins Ranch, LLC, to Teo and Sarah Maestrejuan was completed July 19, 2012. No changes in the application for grazing permit renewal were requested at the time of grazing permit transfer.

The Petan Company of Nevada, Inc. submitted an application dated June 29, 2011, to renew a permit to graze livestock on the Garat allotment, as revised November 21, 2011 (Appendix F).

An application was received June 27, 2011, from the 06 Livestock Company to renew a permit to graze livestock on the Swisher Springs and Swisher FFR allotments (Appendix G).

Renewed grazing permits would be in conformance with the Owyhee Resource Management Plan (ORMP) (USDI BLM, 1999a), ensure compliance with the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Idaho S&Gs) adopted in 1997 (Appendix A), and comply with 43 CFR 4100 – Grazing Administration. Federal actions must be analyzed in accordance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations to determine potential environmental consequences.

LANDS INVOLVED

Meridian	Township	Range	Sections	Acres PD
Boise	11S	3W	20, 28, 29, 31, 32, 33	252,291
	11S	4W	21, 22, 26-28, 31-35	
	12S	3W	4-8, 17-20, 29-31	
	12S	4W	1-36	
	13S	3W	5-8, 16-21, 28-32	
	13S	4W	1-36	
	13S	5W	35, 36	
	14S	1W	7, 18, 19, 30, 31	
	14S	2W	1-36	
	14S	3W	1-36	
	14S	4W	1-36	
	14S	5W	1, 2, 11-13, 24, 25, 36	
	15S	1W	1-36	
	15S	2W	1-36	
	15S	3W	1-36	
	15S	4W	1-6, 8-16, 22-27, 35, 36	
	16S	1E	6, 7, 18, 19, 30	
	16S	1W	1-30	
	16S	2W	1-30	
	16S	3W	1-29	
	16S	4W	1, 12, 13	

The Castlehead-Lambert allotment is located approximately 60 miles southwest of Murphy, Idaho, and 45 miles southeast of Jordan Valley, Oregon, with the East Fork Owyhee River as its southern boundary. The allotment includes Lambert Table and is bordered by Juniper Mountain on the north and Red Canyon on the west. The allotment includes 45,826 acres of public land, 217 acres of state land, and three acres of private land in six pastures. A rangeland health assessment and evaluation report for the Castlehead-Lambert allotment was completed in January 2012 (USDI BLM, 2012a). The Idaho Standards for Rangeland Health not met include Standards 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, 4-Native Plant Communities, 7-Water Quality, and 8-Threatened and Endangered Plants and Animals. The allotment met Standard 1-Watersheds. Standards 5-Seedings and 6-Exotic Plant Communities, other than Seedings were not evaluated separately but were included in the assessment of Standard 4-Native Plant Communities. The Rangeland Health Assessment and Evaluation Report for the Castlehead-Lambert allotment is incorporated in this NEPA document by reference. However, some of the pasture names have since changed, as noted below:

Pasture name and number in RHA	Pasture name and number in this EA
Pasture 1a Castlehead	Pasture 1 Castlehead
Pasture 1b Mountain	Renamed Pasture 6 Between-the-Canyons
Pasture 2 Carter Springs	(remains the same)
Pasture 3 Red Basin	(remains the same)
Pasture 4 Lambert Table	(remains the same)
Pasture 5 Horse	(remains the same)

The determination for the Rangeland Health Assessment and Evaluation Report for the Castlehead-Lambert allotment was completed in July 2012 and can be found in Appendix I. Current livestock management practices were determined to be significant factors in failing to achieve Standards 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, 7-Water Quality, and 8-Threatened and Endangered Plants and Animals. Other factors, which will be outlined below, contributed to not achieving Standard 4-Native Plant Communities (Appendix I).

The Garat allotment is located immediately south of the Castlehead-Lambert allotment, approximately 75 miles south of Murphy, Idaho, and north of the Nevada state line. The allotment is bordered by the East Fork Owyhee River on the north, South Fork Owyhee River on the west, and the Duck Valley Indian Reservation on the east. The allotment includes 202,618 acres of public land, 8,836 acres of state land, and 207 acres of private land in six pastures. A rangeland health assessment and evaluation report for the Garat allotment was completed in January 2012 (USDI BLM, 2012b). The Idaho Standards for Rangeland Health not met include 1-Watersheds, 4-Native Plant Communities, and 8-Threatened and Endangered Plants and Animals. Standards met include 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, and 7-Water Quality. Standards 5-Seedings and 6-Exotic Plant Communities, other than Seedings were not evaluated separately but were included in the assessment of standard 4-Native Plant Communities. The Rangeland Health Assessment and Evaluation Report for the Garat allotment is incorporated in this NEPA document by reference. The determination for the Rangeland Health Assessment and Evaluation Report for the Garat was completed in July 2012 (Appendix J). Current livestock management practices were determined to be significant factors in failing to achieve Standards 4-Native Plant Communities and 8- Threatened and Endangered Plants and Animals. Other factors contributed to not achieving Standard 1-Watersheds, as outlined below. The determination for the allotment can be found in Appendix J.

The Swisher Springs allotment is located adjacent to and east of the Castlehead-Lambert allotment. The Swisher Springs allotment includes 3,847 acres of public land, 4 acres of private land, and no state land in three pastures. The Swisher FFR allotment is located adjacent to and north of the Swisher Springs allotment, 55 miles south of Murphy, Idaho. The Swisher FFR allotment includes 153 acres of public land, 628 acres of private land, and no state land. A rangeland health assessment and evaluation report for the Swisher Springs and the Swisher FFR allotments was completed in January 2012 (USDI BLM, 2012c). The Idaho Standards for Rangeland Health not met in the Swisher Springs allotment include 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, 7-Water Quality, and 8-Threatened and Endangered Plants and Animals. The Standards met include 1-Watersheds and 4-Native Plant Communities. Standards 5-Seedings and 6-Exotic Plant Communities, other than Seedings were not evaluated separately but were included in the assessment of Standard 4-Native Plant Communities. The

Idaho Standards for Rangeland Health met in the Swisher FFR allotment include 1-Watersheds, 4-Native Plant Communities, and 8-Threatened and Endangered Plants and Animals. Standards 5-Seedings and 6-Exotic Plant Communities, other than Seedings were not evaluated separately but were included in the assessment of standard 4-Native Plant Communities. The Standards 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, and 7-Water Quality are not applicable to the Swisher FFR allotment. The Rangeland Health Assessment and Evaluation Report for the Swisher Springs and the Swisher FFR allotments is incorporated in this NEPA document by reference. The determination for the Rangeland Health Assessment and Evaluation Report for the Swisher Springs and the Swisher FFR allotments was completed in July 2012 (Appendix K). Current livestock management practices were determined to be significant factors in failing to achieve Standards 2-Riparian Areas and Wetlands, 3-Stream Channel/Floodplain, 7-Water Quality, and 8-Threatened and Endangered Plants and Animals in the Swisher Springs allotment (Appendix K).

A summary of the findings and determinations for the Owyhee River Group allotments is provided in table RHA-1.

Table RHA-1: Rangeland health findings and determinations for the Owyhee River Group allotments

Allotment	Standards are met	Standards are not met	Standards are not applicable	Current livestock management practices are significant factors	Other factors
Castlehead-Lambert	1	2, 3, 4, 7, 8	5, 6	2, 3, 7, 8	4
Garat	2, 3, 7	1, 4, 8	5, 6	4, 8	1
Swisher Springs	1, 4	2, 3, 7, 8	5, 6	2, 3, 8	
Swisher FFR	1, 4, 8		2, 3, 5, 6, 7		

1.4 Purpose and Need

The purpose of this action is to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Appendix A).

The need for this action is established by the Taylor Grazing Act (TGA), the Federal Land Policy and Management Act (FLPMA), and the Owyhee Resource Management Plan (ORMP) (USDI BLM, 1999a), which require that the BLM respond to applications to fully process and renew permits to graze livestock on public land. In detail, the analysis of the actions identified in the applications for grazing permit renewals and the alternative actions is needed because:

- BLM Idaho adopted the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Idaho S&Gs) in 1997 (Appendix A). Rangelands should be meeting or making significant progress toward meeting the standards and must provide for proper nutrient cycling, hydrologic cycling, and energy flow. Guidelines direct the selection of grazing management practices and, where appropriate, livestock facilities to promote significant progress toward, or the attainment and maintenance of, the standards. Rangeland health assessments and evaluation reports completed for the Garat, Castlehead-Lambert, Swisher Springs, and Swisher FFR allotments identify a number of standards that have not been met (USDI BLM, 2012a) (USDI BLM, 2012b) (USDI BLM, 2012c).

- The ORMP identifies resource management objectives and management actions that establish guidance for managing a broad spectrum of land uses and allocations for public lands in the Owyhee Field Office. The ORMP allocated public lands within the Castlehead-Lambert, Garat, Swisher Springs, and Swisher FFR allotments available for domestic livestock grazing. Where consistent with the goals and objectives of the ORMP and Idaho S&Gs, allocation of forage for livestock use and the issuance of grazing permits to qualified applicants are provided for by the Taylor Grazing Act (TGA) and the Federal Land Policy and Management Act (FLPMA).

1.5 Supporting Information

Supporting background information not included as part of this EA document consists of:

- Digital photos taken in upland and riparian areas where BLM conducted standards assessment field work
- Upland and riparian field forms used to document Idaho BLM standards assessments
- Field forms and digital photos of upland and riparian monitoring areas

All information listed above is available to the public in digital format and may be obtained from BLM upon request.

1.6 Scoping, Issues, and Decision to be Made

1.6.1 Scoping

The Owyhee Field Office (OFO) range staff, Field Manager, and members of the NEPA Permit Renewal (NPR) Team met with the permittees for the Castlehead-Lambert, Swisher, and Swisher FFR allotments on November 17, 2011 and with the Garat allotment permittee on November 9, 2011, to discuss allotment conditions, objectives, and livestock management on the respective allotments. OFO range staff and NPR Team members met again with the Garat allotment permittee on February 9, 2012, for further discussion. On January 27, 2012, the Owyhee Field Manager issued the scoping document for the Castlehead-Lambert, Garat, Swisher Springs, and Swisher FFR allotments in this EA (DOI-BLM-ID-B030-2012-0012-EA, *Owyhee River Group 1 Allotments Livestock Grazing Permit Renewal Environmental Assessment*) to all affected grazing permittees, interested publics, and other State and local governments of record for a 30-day comment and review period. The scoping document was presented to the Shoshone-Paiute Tribes on January 19 (comments were received at the February 16, 2012, meeting) and Owyhee County Commissioners on January 23, 2012.

A preliminary EA was available for a 45-day public review ending October 23, 2012. Comments received are summarized and responses provided in Appendix N.

1.6.2 Scoping Comments

Comments were received from Katie Fite of Western Watersheds Project (WWP), Petan Co. of NV (Petan), and Idaho Department of Environmental Quality (IDEQ).

WWP provided the most comments. In summary, the group's comments pertained to plants and fish/wildlife on the allotments (including special status species), riparian areas, soils, wilderness areas, livestock grazing, rangeland management of the allotments, alternatives presented in the scoping document and additional alternatives, cumulative effects, and the scoping document itself. They expressed concern about the current conditions of the allotment and the effects of recent livestock grazing and fires on the riparian areas, the natural vegetation, wildlife habitat, and the establishment of noxious and invasive weeds. They identified the need to protect sage-grouse habitat as a primary concern. The group also questioned the validity of the data used to complete the rangeland health assessments, and they stated that the scoping document contained only a limited range of alternatives with no reductions in livestock use to improve the current conditions. WWP also requested that the BLM complete an Environmental Impact Statement (EIS) instead of an Environmental Assessment (EA) for these allotments.

Petan Co. of NV commented on the sections of the RHA/ERs that they agreed with, questioned the validity of the data used to determine whether the allotments are meeting the Standards, and suggested a different approach to determine the minimum sage-grouse numbers necessary to maintain healthy populations of the species on this land.

IDEQ stated that they do not comment on individual projects but recommended specific state regulations that the BLM should review to ensure that this project is in compliance.

1.6.3 Issues

Through the scoping process and development of the Rangeland Health Assessment/Evaluation Reports, the BLM interdisciplinary team identified the following issues concerning livestock grazing management in one or more of the Owyhee River Group allotments:

- Issue 1: Improve upland vegetation plant communities, and in particular, reverse the shift from desirable to undesirable native plant communities.
- Issue 2: Improve watershed conditions within upland sites.
- Issue 3: Limit juniper encroachment into shrub-steppe vegetation types.
- Issue 4: Prevent introduction and spread of noxious and invasive annual species (e.g., cheatgrass).
- Issue 5: Improve riparian vegetation and stream-bank stability associated with streams and springs/seeps.
- Issue 6: Protect special status plants and improve the habitats supporting special status plants.
- Issue 7: Improve wildlife habitats, and habitats necessary to meet objectives for sagebrush-dependent species, including sage-grouse.
- Issue 8: Consider whether grazing within Group 1 allotments can be used to limit wildfire.
- Issue 9: Consider impacts to regional socioeconomic activity generated by livestock production.

1.6.4 Decision to be Made

The Owyhee Field Manager is the authorized officer responsible for the decisions regarding management of public lands within these four allotments. Based on the results of the NEPA analysis, the authorized officer will issue a determination of the significance of the environmental effects and whether an environmental impact statement (EIS) would be required. If the authorized officer determines that it is not necessary to prepare an EIS, the EA will provide information for the authorized officer to make an informed decision whether to renew the applicants' grazing permits and if renewed, which management actions, mitigation measures, and monitoring requirements will be prescribed for each of the four allotments to ensure management objectives and Idaho S&Gs are met.

1.7 Conformance

The alternatives analyzed here involve public lands and are subject to and in conformance with the ORMP dated December 1999. Relevant objectives from the ORMP are summarized below:

- SOIL 1: Improve unsatisfactory and maintain satisfactory watershed health/condition on all areas.

- SOIL 2: Achieve stabilization of current, and prevent the potential for future, localized accelerated soil erosion problems (particularly on stream banks, roads, and trails).
- WATR 1: Meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area.
- VEGE 1: Improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas.
- RPN 1: Maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions. Riparian-wetland areas include streams, springs, seeps, and wetlands.
- WDLF1: Maintain or enhance the condition, abundance, structural stage, and distribution of plant communities and special habitat features required to support a high diversity and desired population of wildlife.
- FISH 1: Improve or maintain perennial stream/ riparian areas to attain satisfactory conditions to support native fish.
- SPSS1: Manage special status species and habitats to increase or maintain populations at levels where their existence is no longer threatened and there is no need for listing under the Endangered Species Act of 1973, as amended.
- LVST 1: Provide for sustained level of livestock use compatible with meeting other resource objectives.
- VISL1: Manage the public lands for visual resource values under visual resource management classifications.
- WNES 2: Following any enabling legislation, manage designated wilderness areas to ensure an enduring wilderness resource.
- CULT 1: Protect known cultural resource values from loss until their significance is determined.
- CULT 2: Provide special management emphasis for the protection and conservation of significant cultural resource sites and values.
- ACEC 1: Retain existing and designate new areas of critical environmental concern (ACECs) where relevance and importance criteria are met and where special management is needed to protect the values identified.

Relevant Statutes, Regulations, or Other Plans:

- American Indian Religious Freedom Act of 1978
- Archaeological Resource Protection Act of 1979
- Bald and Golden Eagle Protection Act
- Bureau of Land Management 6840 Manual on Special Status Species Management 2008
- Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy 2010
- Clean Air Act of 1970 (amended 1990)
- Clean Water Act of 1972
- Code of Federal Regulations (CFR); Title 40; Part 1500 – Council on Environmental Quality 2009
- CFR; Title 43; Part 4100 – Grazing Administration – Exclusive of Alaska 2006
- Coordinated Implementation Plan for Bird Conservation in Idaho
- Endangered Species Act (ESA) of 1973, Section 7, as amended
- Federal Land Policy and Management Act 1976
- Greater Sage-Grouse Interim Management Policies and Procedures [1]
- Idaho Comprehensive Wildlife Conservation Strategy 2005
- Idaho Forest Practices Act (1974), Title 38, Chapter 13, Idaho Code

[1] Per BLM Instruction Memorandum No. 2012-043
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-043.html

- Idaho Sage-Grouse Conservation Strategy 2006
- Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management
- Interim Strategy for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California 1995 (PACFISH)
- Migratory Bird Treaty Act of 1918 (MBTA)
- National Fire Plan 2000
- National Historic Preservation Act of 1966
- Native American Graves Protection and Repatriation Act of 1990
- North American Mule Deer Conservation Plan
- The Omnibus Public Lands Management Act of 2009
- The Public Rangeland Improvement Act of 1978
- The Taylor Grazing Act of 1934
- The Wild and Scenic Rivers Act of 1968
- The Wilderness Act of 1964

2 PROPOSED ACTION AND ALTERNATIVES

Five alternatives are considered and analyzed in this environmental assessment. Alternatives to the authorizations and actions identified in applications for grazing permit renewal received by BLM that are considered and analyzed is this EA include a current situation alternative, a performance-based alternative, a season-based alternative, and a no-grazing alternative. A number of actions identified by internal and external sources were also considered, but not analyzed as identified in Section 2.6. In addition to the descriptions of the theme of each of the five alternatives, terms and conditions of permits, and the allotment specific authorizations and actions under each alternative in the sections that follow, Appendix D is a comparison table of authorizations and actions included in each of the five alternatives.

2.1 Alternative 1 – Current Situation

In accordance with the BLM NEPA Handbook (H-1790-1), the Current Situation alternative for externally generated proposals or applications is generally to reject the proposal or deny the application. The sole exception to this is for renewal of a grazing permit, for which the Current Situation alternative is to issue a new permit with the same terms and conditions as the expiring permit. The Current Situation alternative, defined as the actions that have led to current conditions and which have occurred under the authorization provided by the current grazing permit, provides a useful baseline for comparison of environmental effects and demonstrates the consequences of not meeting the need for the action. For this analysis, the highest reported use level in the past 10 years defines the Current Situation alternative.

Under Alternative 1, permits to graze livestock within the Castlehead-Lambert, Garat, Swisher Springs, and Swisher FFR allotments would be renewed with the terms and conditions of permits currently in effect, with changes to reflect recent actions that have led to current conditions. Permits currently authorizing grazing within these allotments are implemented consistent with permits that were in effect in 1997. In an order dated February 29, 2000, (Civ. No. 97-0519-S-BLW), the United States District Court for the District of Idaho imposed interim terms and conditions on the grazing permits renewed by the BLM in 1997, in response to a lawsuit challenging the permit renewals. The interim terms and conditions were to remain in place until completion of NEPA analysis and implementation of final decisions under the 1999 Owyhee Resource Management Plan with the associated EIS and the Idaho Standards for Rangeland Health and Guidelines for Grazing Management. Interim terms and conditions imposed are:

- Key herbaceous riparian vegetation, where stream bank stability is dependent upon it, will have a minimum stubble height of 4 inches on the stream bank, along the greenline, after the growing season;
- Key riparian browse vegetation will not be used more than 50 percent of the current annual twig growth that is within reach of the animals;
- Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed more than 50 percent during the growing season, or 60 percent during the dormant season; and
- Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

The interim terms and conditions would be incorporated as other terms and conditions in all permits offered for grazing use within the Castlehead-Lambert, Garat, Swisher Springs, and Swisher FFR allotments with implementation of Alternative 1 – Current Situation.

2.2 Alternative 2 – Applicants' Proposed Action

BLM received applications for renewal of grazing permits from current permittees authorized to graze livestock within the Castlehead-Lambert, Garat, Swisher Springs, and Swisher FFR allotments. The applicants included terms and conditions required for all BLM grazing permits. In accordance with regulations, mandatory terms and conditions include the kind and number of livestock, the period of use, the allotment to be used, the amount of use (in animal unit months[2] (AUMs)), and terms and conditions that ensure conformance with the fundamentals of rangeland health and standards and guidelines for grazing administration. In addition, other terms and conditions in applications include those that will assist in achieving management objectives, provide for proper range management, or assist with the orderly administration of the public rangelands.

Under Alternative 2, grazing permits would be offered with terms and conditions identified in the applications received. The applications received are provided in appendices E, F, and G.

2.3 Alternative 3 – Performance-based

Under Alternative 3, terms and conditions of grazing permits would identify intensities of livestock use that would be used to limit adverse impacts from livestock grazing on resource values. BLM developed Alternative 3 – Performance-based to ensure that rangeland health standards and ORMP management objectives would be met, or significant progress would be made toward meeting those standards and objectives where current livestock management practices have contributed toward not meeting the standards and objectives. Resource issues addressed by Alternative 3 are identified in the 2012 rangeland health assessments and evaluation reports for the Owyhee River Group allotments (USDI BLM, 2012a), (USDI BLM, 2012b), (USDI BLM, 2012c). Alternative 3 operates by adding performance-based terms and conditions to grazing permits (Table ALT-1, ALT-12, ALT-26, and ALT-39). These new terms and conditions would be implemented to improve and maintain the health and vigor of upland perennial herbaceous species, maintain hydrologic function and soil/site stability, meet riparian management objectives, and provide suitable habitats for special status wildlife species, including sage-grouse.

Alternative 3 would not change livestock numbers, scheduled beginning and end dates for use of the allotments, pasture rotations, pasture seasons of use, active use AUMs, or other terms and conditions from those in current permits. Alternative 3 only differs from current permits with the addition of performance-

[2] Animal unit month (AUM) means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

based terms and conditions. Flexibility would be provided to allow seven days to complete moves between pastures.

To facilitate meeting Rangeland Health Standard 4-Native Plant Communities and to meet the ORMP vegetation management objective VEGE-1, a utilization limit of less-than-or-equal-to the slight category (≤ 20 percent) at the end of the active growing season (July 1) would be implemented for pastures used during the active growing season for native bunchgrass species (May 1 – July 1) (USDI BLM 1999a) (Table ALT-1, ALT-12, ALT-26, and ALT-39). The seasonal utilization performance-based terms and conditions would also be employed to meet Rangeland Health Standard 1-Watersheds and to meet ORMP soils management objectives, SOIL-1 and SOIL-2. The intent for the performance-based terms and conditions for upland perennial species is to limit impacts to perennial bunchgrasses and maintain health and vigor when pastures are grazed during the active growing season. Generally, bluebunch wheatgrass is the most grazing-sensitive and common bunchgrass species and will be used as an indicator for other species. Researchers have identified a need to limit the intensity of grazing use and provide at least 2 years of deferment for each year of active growing season use. All permit schedules under Alternative 3 have more frequent growing-season use. These terms and conditions limiting the intensity of grazing use in upland vegetation communities would rely on the slight use of perennial bunchgrass species during the active growing season to be the limiting factor, to provide for maintenance and improvement of perennial vegetation health and vigor, in place of frequent deferment of grazing use to a period outside the active growing season or year-long rest.

To facilitate meeting Standard 2-Riparian Areas and Wetlands, Standard 3-Stream Channel/Floodplain, Standard 7-Water Quality, and the ORMP riparian management objective for lentic and lotic systems, RIPN-1, terms and conditions of grazing permits would establish minimum riparian stubble height, limits to woody browse, and limits to bank alteration (Table ALT-1, ALT-12, ALT-26, and ALT-39). These terms and conditions would retain adequate vegetation along stream margins (bankfull level) and floodplains to dissipate hydrologic energy. Additionally, these terms and conditions would limit physical impacts from livestock that expose stream banks and springs to erosive hydrologic forces and alter water flow patterns.

To facilitate meeting Standard 8-Threatened and Endangered Animals and the ORMP objectives for special status wildlife species (SPSS-1), wildlife habitat (WLDF-1), and fisheries habitat (FISH-1), terms and conditions of the grazing permits would establish minimum perennial herbaceous vegetation height limits in important upland habitats (Table ALT-1, ALT-12, ALT-26, and ALT-39). Perennial herbaceous vegetation includes forbs and common bunchgrasses such as bluebunch wheatgrass, Idaho fescue, Thurber's needlegrass, squirreltail, Indian ricegrass, and crested wheatgrass. Although the common bluegrass species (*Poa secunda* and *P. bulbosa*) in the OFO are considered perennial bunchgrasses, they would be excluded from measurement and analysis because of their low stature and limited ability to provide concealment cover. These terms and conditions would ensure adequate vegetation concealment cover is maintained within sagebrush habitats for sage-grouse breeding in particular. In addition, terms and conditions of the grazing permits would establish minimum stubble height, and woody species use and bank alteration limits in riparian habitats primarily but not exclusively for the benefit of migratory birds, Columbia spotted frogs, and redband trout. These terms and conditions would ensure adequate vegetation structure and cover for breeding, nesting, and foraging is maintained within riparian habitats.

Monitoring would be conducted at an adequate number of representative key areas within pastures and allotments at the discretion of the OFO. Although many of these key areas have been previously identified (e.g., trend, utilization, MMIM, and sage-grouse habitat assessment sites), it is likely that more locations would be identified to provide sufficient representation of vegetation communities and conditions within applicable pastures/allotments. It should also be noted that a single site and/or technique can and would be used to address performance-based criteria for various resources. For example, stubble height measurements at the Castle Creek MMIM site in pasture 1 of the Castlehead-Lambert allotment would be used to measure conditions of both riparian lotic and riparian (lotic) wildlife habitat resources.

Upon failure to meet any one performance-based term and condition in an allotment in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management[3]. As noted in analysis of Alternative 3 in Chapter 3 of this EA, native perennial vegetation in upland ecological sites, as well as riparian function in affected ecosystems, have the resilience to withstand disturbances and rebound following infrequent disturbances. Resilience that allows recovery of upland vegetation and riparian function is exceeded following repetitive disturbance; two or more incidents within a 5-year period that exceed the thresholds of identified performance-based terms and conditions.

Metrics for the performance-based terms and conditions that are identified in Table ALT-1 would be monitored within each applicable pasture the first 2 years of the grazing schedule when the performance-based terms and conditions apply. Upon compliance, with no incidence of exceeding the threshold of a metric during the first 2 applicable years within all pastures of an allotment, the metric for that term and condition within each pasture would be monitored again at a minimum of 1 applicable year of every 5 years during the remaining term of the 10-year grazing permit. More frequent monitoring may occur at the discretion of the authorized officer, particularly when site visits and visual inspections indicate that performance-based terms and conditions may be exceeded. Upon any failure of grazing management practices to be in compliance with the performance-based terms and conditions, monitoring of the metric found to exceed the threshold would be completed in the allotment during the next 2 years when the performance-based terms and conditions apply to the resource and the scheduled grazing use of each pasture in the allotment.

Two consecutive years of compliance with performance-based terms and conditions indicates a history of compliance and implementation of appropriate livestock management practices to protect and enhance resource values, supporting a reduced need for monitoring to determine compliance with the terms and conditions. Upon establishment of a history of compliance with performance-based terms and conditions, periodic monitoring (a minimum of 1 in 5 years as described above) to identify continued compliance would occur.

[3] Permittees retain the ability to use performance terms and conditions to adjust livestock management practices consistent with terms and conditions of the grazing permit and within the grazing season to better meet endpoint indicators.

Table ALT-1: Performance-based terms and conditions summary

Resource	Resource Objective	Method	Metric	Threshold	Sampling Period
Uplands	ORMP VEGE 1: Improve unsatisfactory and maintain satisfactory health/condition on all areas ORMP SOIL 1: Improve unsatisfactory and maintain satisfactory watershed health/condition on all areas ORMP SOIL 2: Achieve stabilization of current and prevent the potential for future localized accelerated soil erosion problems	Herbaceous Utilization; Key Species Method (USDI USFWS, 2008)	Intensity of grazing use during the active growing season on bluebunch wheatgrass; percent utilization	Limit utilization of bluebunch wheatgrass in all key areas[4] within pastures scheduled for active growing season use to no greater than the slight category[5] (≤20%)	At or about the end of the active growing season for upland bunchgrass species (July 1)[6] when active growing season (May 1 – July 1) grazing use is scheduled for a pasture.

[4] Upland key areas for performance-based term and condition monitoring may include the locations of trend plots and other locations which fit the definition of a key area provided in BLM Technical Reference 1734-3: Utilization studies and residual measurement. Key areas may be cooperatively chosen by OFO specialists, permittees, and other interested public.

[5] The benefits of limiting intensities of grazing use, as opposed to defining seasons of grazing use, to allow grass species recovery and maintenance of health and vigor has been proposed by some range professionals (Holechek, Gomez, Molinar, & Galt, 1999) (Holechek, Thomas, Molinar, & Galt, 1999). Holechek's review of the long-term stocking rate and grazing system studies included primarily studies completed in the Great Plains and forested communities and suggested that stocking rates be set to maintain utilization levels below 35 percent. Vegetation communities in the Great Plains and forested communities are more tolerant of grazing pressure than sagebrush steppe vegetation communities present in the Owyhee group allotments. As a result, the more conservative 20 percent utilization limit during the active growing season was established under this alternative, followed by the ORMP maximum allowable utilization limit of 50 percent for use outside the active growing season.

[6] Although the growing season may extend later than July 1 in some years as a result of timely June rain, bunchgrass plants have completed nearly all growth by July 1 in most years and recording the intensity of grazing use that occurred during the active growing season can reasonably be completed. The 50 percent maximum allowable utilization identified as an action to meet the ORMP vegetation objective may require additional utilization monitoring in any pasture that is grazed during the active growing season if that use extends after July 1.

Resource	Resource Objective	Method	Metric	Threshold	Sampling Period
Riparian Lotic	ORMP RIPN 1: Attain and maintain riparian-wetland areas to attain proper functioning and satisfactory condition. Riparian-wetland aread include streams, springs, seeps, and wetlands ORMP SPSS 1: restore and maintain suitable nesting/foraging structure and cover for riparian-dependent migratory bird species ORMP FISH 1: restore and maintain suitable habitat for redband trout, spotted frog and other dependent wildlife species	Stubble Height Woody Browse Stream Bank Alteration; MMIM [7] Method 2011	Within key riparian (lotic) areas[8]: inches % %	Stubble Height ≥ 6” Woody Browse ≤ 30% Stream Bank Alteration ≤ 10%	Measure at the end of the grazing season in key riparian areas that were grazed that year
Riparian Lentic	ORMP RIPN 1: Attain and maintain riparian-wetland areas to attain proper functioning and satisfactory condition. Riparian-wetland aread include streams, springs, seeps, and wetlands WILDLIFE OBJECTIVES: restore and maintain suitable herbaceous cover in brood-rearing habitats for foraging and concealment cover restore and maintain suitable lentic habitat for spotted frogs and other dependent wildlife species	Stubble Height Woody Browse Lentic Edge Alteration; Appendix C/ MMIM TR 2011	Within key riparian (lentic) areas[9]: inches % %	Stubble Height ≥ 6” Woody Browse ≤ 30% Edge Shear (alteration) ≤ 20%	Measure at the end of the grazing season in key riparian areas that were grazed that year

[7] MMIM is based in Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation* (USDI BLM 2011)

[8] Riparian key areas for performance-based term and condition monitoring may include the locations of established DMAs and other locations which fit the definition of a key area provided in BLM Technical Reference 1737-23 or 1737-15; Key areas may be cooperatively chosen by OFO specialists, permittees, and other interested public

[9] Riparian key areas for performance-based term and condition monitoring may include the locations of previously assessed lentic areas and other locations which fit the definition of a key area provided in BLM Technical Reference 1737-16; Key areas may be cooperatively chosen by OFO specialists, permittees, and other interested public

Resource	Resource Objective	Method	Metric	Threshold	Sampling Period
Sage-grouse Upland Habitat	ORMP SPSS 1: Manage special status species and habitats to increase or maintain populations	Perennial Herbaceous Vegetation Height[10]	Perennial herbaceous vegetation height (inches) of live and residual perennial grasses and forbs; key species include bluebunch wheatgrass, fescue, needlegrass, squirreltail, Indian ricegrass, and crested wheatgrass.	Limit perennial herbaceous vegetation height to: •≥7 inches within PPH-sagebrush in pastures grazed from March 15-June 15 during years when pasture is grazed. •≥4 inches within PPH-sagebrush in pastures grazed from June 16-October 31 during years the pasture is grazed.	At or about the end of the active growing season for upland bunchgrass species (July 1)[4] in pastures grazed from March 15-June 15 during years when pasture is grazed. Conduct post-grazing in pastures grazed from June 16-October 31 during years the pasture is grazed.
Riparian (lotic) Wildlife Habitat	ORMP 1: Maintain or enhance the condition, abundance, structural stage and distribution of plant communities and special habitat features required to support a high diversity and desired population of wildlife. ORMP FISH 1: Improve or maintain perennial stream/riparian areas to attain satisfactory condition to support native fish. ORMP SPSS 1: Manage special status species and habitats to increase or maintain populations	Stubble Height[11] Woody Species Use[12]	Within key riparian (lotic) areas[13]: Mean stubble height (inches) of all key species; Average use (%) for all woody species	Limit stubble height to: ≥6 inches Limit woody species use to: •≤30%	Conduct post-grazing season simultaneously with lotic riparian monitoring above

[10] Perennial herbaceous vegetation height measurements would be conducted at new and established sage-grouse habitat assessment sites following protocols established in Connelly et al. (2003) (Connelly, Reese, & Schroeder, 2003) and USDI BLM (2010).
[11] Stubble height technique as described in the Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation* (USDI BLM 2011)
[12] Woody species use technique as described in the Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation* (USDI BLM 2011)
[13] Riparian key areas for performance-based term and condition monitoring may include the locations of established DMAs and other locations which fit the definition of a key area provided in BLM Technical Reference 1737-23 or 1737-15; Key areas may be cooperatively chosen by OFO specialists, permittees, and other interested public

2.4 Alternative 4 – Season-based

Under Alternative 4, seasons of grazing use would be used to limit adverse impacts from livestock grazing on resource values. BLM developed Alternative 4 – Season-based to ensure that rangeland health standards and ORMP management objectives would be met, or significant progress would be made toward meeting those standards and objectives where current livestock management practices have contributed toward not meeting the standards and objectives. Resource issues addressed by Alternative 4 are identified in the 2012 rangeland health assessments and evaluation reports for the Owyhee River Group allotments (USDI BLM, 2012a), (USDI BLM, 2012b), (USDI BLM, 2012c). Limitations to seasons of use were developed and used to define a grazing rotation for each allotment, which would 1) provide more frequent year-long rest or deferment of livestock grazing use to a period outside the active growing season for native perennial bunchgrass species, 2) limit disruption and herbaceous utilization associated with livestock management activities within sage-grouse breeding habitats, and 3) limit mid-summer grazing use of riparian areas. Flexibility would be provided to allow 7 days to complete moves between pastures, as long as cattle grazing in pastures containing identified riparian resources does not occur between July 1 and September 15 and periods of deferment outside dates identified to meet upland vegetation and sage-grouse habitat requirements are met.

2.5 Alternative 5 – No Grazing

Under Alternative 5, no grazing would be authorized on public lands within the Castlehead-Lambert, Garat, Swisher Springs, or Swisher FRR allotments for a term of 10 years. Applications for grazing permit renewal would be denied and no grazing permits would be offered. All 5,324 AUMs of permitted use in Castlehead-Lambert allotment (3,244 AUMs active use; 2,080 AUMs suspension), 33,646 AUMs of permitted use in Garat allotment (19,500 AUMs active use; 3,250 AUMs of voluntary nonuse; 10,896 AUMs suspension), 537 AUMs of permitted use in Swisher Springs allotment (345 AUMs active use; 192 AUMs suspension), and 15 AUMs of permitted use in Swisher FFR allotment (15 AUMs active use; 0 AUMs suspension) would be cancelled and unavailable for livestock grazing on public lands. Upon expiration of the 10-year term, livestock grazing on the allotment(s) would be reevaluated, with retention of preference (priority for grazing authorization) for approval of application(s) for grazing permit(s) attached to current base property(s).

2.6 Alternatives Considered but Not Analyzed in Detail

Grazing permit renewal with current terms and conditions

The renewal of the grazing permit with the same terms and conditions as the current permits is the equivalent of a no-action alternative and was considered but not analyzed. In accordance with the BLM NEPA Handbook (H-1790-1), the no-action alternative for externally generated proposals or applications is generally to reject the proposal or deny the application. The sole exception to this is for renewal of a grazing permit, for which the no-action alternative is to issue a new permit with the same terms and conditions as the expiring permit. As noted in the BLM NEPA Handbook, an alternative that documents the current and future state of the environment can be used to compare the effects brought about by the proposed action or alternatives.

Often, the livestock management practices recently implemented and that have resulted in documented resource conditions differ to some degree from terms and conditions of the current permit. As a result, analysis of an alternative that lists terms and conditions of the current grazing permit does not serve a purpose when recent livestock management practices do not closely follow the terms and conditions of the current grazing permit. This EA analyzes the effects of an alternative (Alternative 1 – Current Situation) that reflects livestock management actions that have been recently implemented, rather an alternative that would renew the grazing permits with terms and conditions unchanged, to provide the baseline for analysis that documents the current and future state of the environment in the absence of action.

Management Alternatives

The following additional Group 1 (Owyhee River) management alternatives were submitted by Western Watersheds Project (WWP) in April 2012 to the BLM for consideration during development of this environmental assessment. A brief rationale for why these are considered but are not analyzed in detail follows the recommendations.

On April 13, 2012, WWP submitted a request that BLM include an alternative that would designate ACECs that protect occupied sage-grouse habitats across the landscape that encompass the lands and fulfill all of the sage-grouse seasonal needs to sustain viable populations in the short-, mid- and long-terms. This email also included a copy of *Comments on BLM's Notice of Intent to Address Sage Grouse in Land Management Plans* (dated April 11, 2012) which was submitted to BLM's Wyoming and Nevada State Offices. In this attachment, WWP proposes that BLM include the designation of a Bruneau-Owyhee ACEC in the sage-grouse RMP amendments EIS, which would include the South Fork of Owyhee and Little Owyhee watersheds, lands west of Deep Creek and Battle Creek including Castlehead-Lambert, Bull Basin, the Garat lands (South Fork Owyhee watershed), Tent Creek (Little Owyhee lands), and other areas.

In addition, on April 22, 2012, WWP submitted an alternative suggestion which would include the following actions:

- Enable passive restoration of lands at risk of weed invasion and/or suffering degradation or facing further losses of native species.
- Provide for active restoration and removal of livestock facilities or roads or end practices that damage important, sensitive and imperiled species' habitats and populations. This includes actions such as removal of harmful fences and water developments, salt/supplement sites, and associated roading or other disturbance.
- Provide for active restoration of crested wheatgrass seedings and cheatgrass or other exotic species areas.
- Rely on integrated weed management that ceases grazing disturbance to lands at risk of weed expansion; quarantines livestock coming from weed infested lands before they enter non-infested sites; stops grazing disturbance to infestations until this infestation can be controlled and native species recovered on site; and minimizes herbicide use and focuses on mechanical and other treatments. Trailing/crossing of livestock through weed-infested areas must be prohibited.
- BLM goals must include conserving species' habitats and expand habitats by reducing fragmentation and replanting sagebrush and other vegetation to increase sage-grouse abundance and distribution and providing for viable populations.

WWP's April 13, 2012, request to designate new ACECs has been considered, but will not be analyzed in detail per Section 202(c) of FLPMA (43 U.S.C.1712), which requires that in developing land use plans (or amending existing plans), the BLM must give priority to designating and protecting areas of critical environmental concern (ACECs). Specifically, the request included the designation of ACECs to protect intact sagebrush habitats and mature and old growth pinyon-juniper communities. Designation of an 83,418-acre (or a smaller 260-acre) ACEC for western juniper in the vicinity of Juniper Mountain was considered in the 1999 FEIS for the Owyhee RMP. Neither was included in the completed Owyhee RMP. Designation of a new ACEC is a land use planning-level decision that would require an amendment to the existing Owyhee RMP. The BLM is not in the position to include an ACEC RMP amendment in this permit renewal process. Grazing authorization renewal is an implementation-level decision that does not involve changes to an RMP.

Regarding WWP's suggestions submitted on April 22, 2012, to implement passive restoration actions to address rangeland impacts including weed infestation, degradation, and loss of native species, BLM is confident that a reasonable range of alternatives have been developed that will be analyzed in detail and will include similar, if not the same, suggestions as those made by WWP. Additionally, regarding WWP's concerns regarding weed management, currently the Boise District has a weed management plan in place that includes an active weed management program within the Owyhee Field Office, including public lands found within the Castlehead-Lambert, Garat, Swisher Springs/Swisher FFR allotments.

WWP's suggestions to provide for active restoration and removal of livestock facilities or roads, including actions such as removal of harmful fences and water developments and providing for active restoration of crested wheatgrass seedings and cheatgrass or other exotic species areas will not be analyzed in detail in this document. The active restoration activities suggested are considered range improvements, which are not being included primarily because in order for BLM to comply with the December 2013 court ordered deadline to complete NEPA and issue final decisions, inadequate time exists to complete the pre-NEPA layout and design and applicable resource surveys and clearances. In general, any project proposed on BLM-managed public lands requires time to coordinate and consult internally and externally on project design; to layout (flagging) the project on the ground; and to complete cultural and wildlife/botany (T&E and/or sensitive species) inventories and clearances. General practice for project implementation includes one field season (summer months) at a minimum to complete these steps of project planning before a proposal can be analyzed in a NEPA document. Therefore, in order for projects to have been included in the Group 1 EA, these steps would have had to have been completed during the 2011 field season.

Permit renewal application revisions

As a portion of the comments received from Petan Company of Nevada, Inc., in response to the scoping package provided by BLM for the Owyhee Group allotments, Petan identified as reasonable an alternative that scheduled reactivation of the 3,250 AUMs that are currently held as voluntary nonuse as a near-future action to be triggered based upon results of continued short-term monitoring. This alternative would be a variation from the application for grazing permit renewal revised November 18, 2011, which requested an increase of active use AUMs from 19, 500 to 22,750 in the Garat allotment. The variation is a difference between authorizing the increase to active use with permit renewal or including an increase of 3,250 AUMs with an increase of 10,896 AUMs based on short- and long-term monitoring over and beyond the 10-year term of the permit.

Similarly, a request for revision of the application from Owyhee Range Service, representing the 06 Livestock Co., and the Collins Ranch, LLC, was received from Owyhee Range Services on July 21, 2012. That revision of the grazing permit renewal application requested that the application be modified to seek no immediate increase in the active use. Instead, requested revision proposed to cooperatively work with BLM to collect data over the next 3 years to determine the true carrying capacity of the Castlehead-Lambert allotment. Those data would be the basis for determining whether an increase in active use is warranted.

Both requests for revision of the actions considered in Alternative 2 of this EA, the applications for grazing permit renewal, would only result in a change to the process for increasing active use. The grazing schedule identified in applications and increases to active use AUMs over the term of the permit would not differ. Analysis completed for the variations from Alternative 2 that were identified in the requests for revision to the applications would be similar to analysis included for Alternative 2. As a result, the revisions were considered but not analyzed.

Wildfire Fuels

Wildfire is a natural event that defines a range of variability in potential vegetation communities of sagebrush steppe vegetation types. Wildfire behavior is dependent on a number of factors, including weather and climatic conditions, as well as the size and connectivity of fuels, fuel loading, fuel moisture, and topographic slope. In the absence of actions that significantly alter fuel loading, wildfire spread rates for grass fuel types and grass/shrub fuel types are similar. Models for the rate of spread in these fuel types follow similar curves for low fuel load and moderate fuel load and differ most at the extremes of fuel moisture and wind speed (USDA USFS, 2005).

Invasive annual grasses have been shown to alter wildfire behavior. Knapp (1996) reviewed the history, persistence, and influences to human activities of cheatgrass dominance in the Great Basin desert and noted that changes in density of cheatgrass have led to commensurate changes in fire frequency. Further, fires have shown a tendency to occur repeatedly within cheatgrass dominated areas. Balch et al (2012) found that cheatgrass-dominated lands had a shorter fire-return interval, were disproportionately represented in the larger fires, were significantly more likely to have been the ignition point for fires, and showed a strong inter-annual response to wet years in comparison to other prominent land cover classes across the Great Basin.

Livestock grazing has been identified as an underutilized tool in assisting managers to achieve fuels and vegetation management objectives. A number of sources suggest that livestock grazing could minimize wildfire impacts to high priority areas (Great Basin Restoration Initiative Workgroup, 2010) (Davies, Bates, Svejar, & Boyd, 2010) (Diamond, Call, & Devoe, 2009) (Taylor, Jr., 2006). The Governor’s Federal alternative for greater sage-grouse management in Idaho says, “The unintended consequences of altering grazing use, such as possible increased risk of wildfire, must be carefully considered in any management proposal” (The State of Idaho, 2012).

Following a series of large wildfires in south-central Idaho and northern Nevada in 2007, a team of scientists, habitat specialists, and land managers examined initial information pertaining to plant communities and patterns of livestock grazing, as they related to fuel loads and fire behavior. Vegetation communities involved in the 2007 fires are similar to sagebrush steppe within the Owyhee River Group allotments. The team concluded that much of the area involved in these fires burned under extreme fuel and weather conditions that likely overshadow livestock grazing as a factor influencing fine fuels and thus fire behavior. One finding was that fire behavior in sagebrush vegetation types is driven by sagebrush cover and height, with the herbaceous component on which livestock focus their grazing playing a lesser role. Consequently, opportunities to influence fire behavior through livestock grazing are greatest in grassland vegetation types. Secondly, the potential effects of grazing on fire behavior are highly dependent on weather, fuel load, and fuel moisture conditions. Grazing applied at sustainable utilization levels would have limited or negligible effects on fire behavior when fuel moisture and weather conditions are extreme. When weather and fuel moisture conditions are less extreme, grazing may reduce the rate of spread and intensity of fires allowing for more patchy burns with lower fuel consumption levels. The team further identified the use of targeted grazing programs on specific areas as greater opportunities when livestock can affect fire behavior through reduction in fine fuels on semi-arid rangelands, as opposed to landscape-scale grazing that is not strategic (USDI USGS, 2008).

Targeted grazing is the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals. The major difference between good grazing management and targeted grazing is that targeted grazing refocuses outputs of grazing from livestock production to vegetation and landscape enhancement (Launchbaugh & Walker, 2006). Recent application of targeted grazing has included control of noxious weeds, control of completing vegetation in agroforestry, and the establishment and maintenance of fuel breaks. Targeted grazing is one of a number of tools available for constructing desirable ecosystems. Targeted grazing should be used in combination with other technologies to meet vegetation management objectives, with consideration for economic, ecological, and social implications.

Sheep and goats have been identified as livestock more conducive to fuel reduction in vegetation types with a shrub component, as compared to cattle. Although woody species are a greater portion of the selected diet of sheep and goats, intensive livestock management, including protein and energy supplements, increases consumption of shrubs (Taylor, Jr., 2006).

A number of sources, in addition to the USGS (2008) report following the Murphy Complex fires, have identified the utility of targeted livestock grazing as one of a number of tools that can be used in an integrated plan to establish and maintain fuel breaks, as opposed to landscape-scale livestock grazing to reduce fuel loads (Great Basin Restoration Initiative Workgroup, 2010) (University of Nevada Cooperative Extension, 2007) (Taylor, Jr., 2006). In addition to the emphasis on site specific targeted grazing to provide fuel breaks, these sources and other citations listed above have consistently noted that grazing as a fuels management tool is primarily limited to grassland dominated vegetation types. Many of these sources recognize the need to ensure that prescriptions for reduction in fine fuels through targeting grazing before the fire season do not also reduce the health and vigor of perennial herbaceous species during the active growing season, do not impair watershed function, or do not limit the ability to meet other resource objectives on a landscape scale. The adverse effect on these resources in small areas to meet targeted grazing prescriptions that establish and maintain linked fuel breaks, needs to be considered against a goal to minimize impacts of wildfire to large areas of intact habitat (Great Basin Restoration Initiative Workgroup, 2010) (USDI USGS, 2008).

The Policy Analysis Group for the College of Natural Resources of the University of Idaho (University of Idaho, 2011a) provided information on policy options related to wildfire management and fuels treatments on Idaho's rangelands. The report summarized the potential benefits and detrimental effects of a number of tools, including livestock grazing. Although the group's report did not recommend an alternative, it focused on landscape-scale treatments and identified livestock grazing as an effective tool to reduce fuel loading. In addition, the report included information on potential adverse impacts from grazing treatments for fuels reductions, the same impacts that are identified in a number of other sources. Like those other sources, the report identified livestock grazing as a complex and dynamic tool with many plant and animal variables.

The role of targeted grazing to manage fuels, as compared to traditional grazing authorizations by permit or lease, is discussed in the Great Basin Restoration Initiative Workgroup's report (2010). Although targeted livestock grazing to reduce fuels within strategic strips or zones can help reduce wildfire impacts, accomplishing this goal is a formidable challenge given the many climatic, biological, wildfire behavior, and livestock management variables that may affect the outcome. The option and benefits of using stewardship contracting are discussed. The report suggests that targeted fuels management is best addressed in a fire management plan which can integrate all wildland fire management guidance, direction, and activities to implement national fire policy and fire management direction from the resource management plan. Taylor (2006) also identified that planning for use of livestock grazing for fuels management planning needs to consider the integration of additional fuels management tools. Livestock grazing actions for fuels management involves a shift in purpose from providing for a use of public lands to a purpose to meet vegetation or fuels objectives.

Diamond, Call, and Devoe (2009) found that targeted, or prescribed, cattle grazing that removed 80 to 90 percent of cheatgrass biomass during the growing season was an effective tool to reduce flame length and rate of spread of fire during the following fire season, especially when combined with late summer prescribed fire treatment and the same grazing treatment in the following year. Few rangeland managers, including the authors in the final sentence of the article, would suggest that native perennial herbaceous species could be maintained, let alone improved, with this series of vegetation treatments. In addition, site stability and watershed function would likely be jeopardized with consecutive years of herbaceous utilization at these levels and with frequent prescribed burning. Ecological objectives should be included as a part of the overall strategy of targeted grazing to reduce fuel loading (Taylor, Jr., 2006). Utilization levels of 50 to 60 percent on crested wheatgrass were effective in creating a patchy burn in the Murphy Complex fires (USDI USGS, 2008). In addition, contracted sheep grazing has been used by the Boise District Bureau of Land Management to establish and maintain narrow fuel breaks in the wildland-urban interface. The BLM has and will continue to develop plans to create fuel breaks that provide firefighters an additional tool in managing wildland fire. Livestock grazing will continue to be a tool available to establish and maintain strategically located fuel breaks.

In conclusion, landscape-scale fuels treatment through livestock grazing has limited application within the sagebrush/bunchgrass vegetation types in the Owyhee River Group allotments, a landscape with few large or connected areas dominated by annual species or grazing tolerant introduced perennial grasses. The use of livestock grazing as a fuels treatment in an integrated program is better adapted to fuels planning and contracting (including stewardship contracting) with objectives for vegetation and fuels management, as opposed to administered through the typical grazing permit/lease program. Although grazing authorized in the alternatives of this EA will reduce fine fuels, the intensity of grazing necessary to be an effective fuels treatment at the landscape-level is outside the purpose and need for this permit renewal EA. Additionally, targeted grazing for fuels reduction to establish fuel breaks is outside the purpose and need of this NEPA document which responds to applications for grazing permit renewal authorizing cattle and horse grazing to meet rangeland health standards and resource management objectives. Therefore targeted grazing is not included in alternatives considered.

Using livestock grazing as a tool for managing vegetation and fuel loads will be addressed in the Idaho/Southwest Montana Environmental Impact Statement for sage-grouse, a planning effort that will amend relevant BLM resource management plans, including the Owyhee Resource Management Plan. Once the RMPs are amended, renewal of permits for grazing within the Owyhee Field Office will incorporate resource objectives and actions according to direction in the amended ORMP.

Climate Change

The science on predicting future climate conditions is continuously evolving. Land management actions might contribute to changes in atmospheric greenhouse gas levels, which can affect global climate. Addressing effects on greenhouse gas (GHG) levels within the scope of NEPA is difficult due to the lack of explicit regulatory guidance on how to meaningfully apply existing NEPA regulations to this evolving issue, and due to the continuously evolving science available at varying levels.

Agencies apply the rule of reason to ensure that their discussion pertains to the issues that deserve study and deemphasizes issues that are less useful to the decision regarding the proposal, its alternatives, and mitigation options (40 CFR 1500.4(f), (g), 1501.7, 1508.25). In addressing GHG emissions, the BLM ensures that such description is commensurate with the importance of the GHG emissions of the proposed action, avoiding useless bulk and boilerplate documentation, so that the NEPA document may concentrate attention on important issues (40 CFR 1502.5, 1502.24).

The BLM’s 2008 NEPA Handbook, H-1790-1, explains that a topic must have a cause-and-effect relationship with the proposed action or alternatives to be considered an issue (H-1790-1, p. 40).

Climate change does not have a clear cause-and effect-relationship with the proposed action or alternatives. It is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate or resource impacts at a specific location.

The proposed action and alternatives, when implemented, would not have a clear, measurable cause-and-effect relationship to climate change because the available science cannot identify a specific source of greenhouse gas emissions such as those from livestock grazing and tie it to a specific amount or type of changes in climate.

Therefore, the effects of livestock grazing to the global climate will not be analyzed in detail in this EA. Effects of climate change on native perennial vegetation resources when also affected by livestock grazing are discussed in the rangeland vegetation sections of this EA.

2.7 Management Actions Common to All Alternatives

Rangeland Project Maintenance and Construction

Cooperative agreements between the individual livestock operators and the BLM have assigned responsibility for rangeland improvement maintenance to the individual operators. The 06 Livestock Company and Teo & Sarah Maestrejuan are required to maintain projects within Castlehead-Lambert allotment, the Petan Co. of Nevada, Inc. (Petan) is required to maintain projects on the Garat allotment, and the 06 Livestock Company is required to maintain projects within the Swisher Springs and Swisher FFR allotments. These cooperative agreements will remain in effect regardless of which grazing permit renewal alternative considered in this NEPA document is implemented. As a result, maintenance of existing projects is outside the scope of this NEPA document.

The application for permit renewal for the Castlehead-Lambert allotment identified construction of new fencing to define the boundary between the Castlehead-Lambert allotment and the Bull Basin allotment as a desire for livestock management, but implementation of the permittees' proposed actions are not dependent on any additional project construction or reconstruction. Additionally, the application for permit renewal in the Garat allotment identified project construction and reconstruction of two wells, but implementation of Petan's application proposed action is not dependent on any additional project construction or reconstruction. The application for grazing permit renewal for use within Swisher Springs or Swisher FFR allotments did not identify any new project construction or maintenance. None of the alternatives considered in this NEPA document for grazing permit renewal is dependent on new project construction. No new project construction or reconstruction is considered within any alternative of this NEPA document. Analysis of consequences of any new project construction, reconstruction, and maintenance will be addressed through separate NEPA analysis specific to the proposed project(s) and will not be included in this NEPA document.

Livestock Trailing/Crossing Authorizations

The Owyhee Field Office received requests between October 2011 and February 2012 from grazing permit holders for authorization to graze on and annually move livestock across public lands overseen by the Owyhee Field Office, other than within the allotment where the permit authorized grazing use. No requests were received for authorization to move livestock across any of the Owyhee River Group allotments. No alternative in this NEPA document will consider authorization to move livestock across public land within any of the Owyhee River Group allotments to access grazing authorizations adjacent to or distant from the Owyhee River Group allotments.

Additionally, applications for Owyhee River Group allotments grazing permit renewal and subsequent meetings with permittees held November 9, 2011, November 15, 2011, and February 9, 2012, identified no need for trailing/crossing authorizations on adjacent public land to access public land within the Owyhee River Group allotments. No alternative in this NEPA document will consider authorization to trail livestock to or from any of the Owyhee River Group allotments in association with the grazing use authorizations.

All alternatives of this NEPA document include authorization to move cattle through pastures within the permitted allotment, but outside dates identified in the grazing schedule in order to complete livestock moves as scheduled. Authorization to move livestock through pastures outside their scheduled use dates is limited to 1 day unless otherwise noted in the schedule. Authorization to leave sick animals and animals not capable of moving with a herd in an unscheduled pasture is also recognized by the BLM and authorized, as long as sick animals and animals not capable of moving are moved through unscheduled pastures in a timely manner.

Grazing Authorization in Swisher FFR Allotment

Livestock grazing in the Swisher FFR allotment is authorized as custodial management. The allotment is primarily composed of private land, with approximately 20 percent public land. All Rangeland Health Standards were met in the Swisher FFR allotment (USDI BLM, 2012c). As a result, livestock management actions identified in Alternatives 1 through 4 are the same as the authorization in the current permit. Analysis of alternative actions for renewing the permit to graze livestock in the Swisher FFR allotment is limited to renewing the permit with terms and conditions unchanged from the current permit and the no-grazing alternative.

Suspension AUMs

In accordance with regulation pertaining to reducing permitted use (43 CFR 4110.3-2), alternatives that result in a reduction in active use AUMs to meet Rangeland Health Standards or make significant progress, as well as reductions in active use AUMs to meet ORMP management objectives, would be implemented by reducing permitted use. Active use AUMs no longer available would not be converted to suspension[14]. Suspension AUMs held on permits prior to this activity planning process would continue to be held on permits as suspension.

Monitoring

Monitoring studies would be conducted during the term of the grazing permits in accordance with guidance provided by the Idaho State Office Instruction Memorandum IM ID-2008-022: Monitoring Strategies for Rangelands. Monitoring studies during the term of permits would include but are not limited to nested plot frequency, upland utilization, browse utilization, photo plots, multiple indicator monitoring (MIM), stubble height measurement, bank alteration, riparian woody browse utilization, and water quality testing.

2.8 Management Actions for Each Allotment

2.8.1 Castlehead-Lambert Allotment (0634)

2.8.1.1 Alternative 1 – Castlehead-Lambert Allotment

Under Alternative 1, BLM would renew the two permits to graze livestock within the Castlehead-Lambert allotment with the same terms and conditions as those in the replaced permits, except for authorized livestock numbers and AUMs of active use. Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would continue to be terms and conditions of the offered permits. This alternative

[14] In accordance with revisions to the grazing regulations as amended through February 6, 1996, paragraph "c" with provisions requiring the authorized officer to hold AUMs comprising the decreasd permitted use in suspension was removed from 43 CFR 4110.3-2.

would authorize grazing at levels equivalent to the maximum actual use reported since 2009 (Appendix B).

The 06 Livestock Co. would be offered a 10-year grazing permit with an active use of 1,783 AUMs, and Teo & Sarah Maestrejuan would be offered a 10-year grazing permit with an active use of 1,237 AUMs, as outlined in Table ALT-2. The alternative includes the elimination of 224 active use AUMs.

Table ALT-2: Permitted grazing use within the Castlehead-Lambert allotment with implementation of Alternative 1 – Current Situation

Permittee	Active Use	Suspension	Permitted Use
06 Livestock Co.	1,783	1,272	3,055
Teo & Sarah Maestrejuan	1,237	808	2,045

The 6-year pasture rotation schedule implemented since 1982 and identified in Table ALT-3 would continue to be a term and condition of the permits. Flexibility in the established grazing schedule to adjust grazing annually due to climatic conditions and other factors, as identified in the terms and conditions of the current permits and as implemented during the 10-year period between 2001 and 2010, would continue to be implemented (See Appendix B for a summary of actual use reported for the Castlehead-Lambert allotment).

Table ALT-3: Castlehead-Lambert allotment grazing schedule with implementation of Alternative 1 – Current Situation

Pasture		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1&6	Castlehead*	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30
2	Carter Spring	5/21 to 7/7	Rest	5/21 to 7/7	4/16 to 5/20	5/21 to 7/7	Rest
3	Red Basin	4/16 to 5/20	5/21 to 7/7	Rest	5/21 to 7/7	Rest	5/21 to 7/7
4	Lambert Table	Rest	4/16 to 5/20	4/16 to 5/20	Rest	4/16 to 5/20	4/16 to 5/20
5	Horse	Used in conjunction with Pasture 3 or with domestic horses in accordance with permits.					

*Pasture 1 - Castlehead was divided in 2005 to create Pasture 1 - Castlehead pasture and Pasture 6 - Between-the-Canyons pasture. Scheduled use would remain unchanged from the 1982 schedule, planned 7/8 to 9/30 annually for both pastures.

Mandatory and other terms and conditions of the offered permits would be defined as listed in Table ALT-4 and Table ALT-5.

Table ALT-4: Mandatory and other terms and conditions of the offered permit for the 06 Livestock Co., to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 1 – Current Situation

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00634 Castlehead-Lambert	310	Cattle	4/15	9/30	100	Active	1,723
	10	Horse	4/8	9/30	100	Active	58

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the 1982 decision of the Boise District Manager and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes to the scheduled use require approval.
2. All cattle 6 months of age or older must be ear-tagged with assigned color and number on the Castlehead-Lambert allotment.
3. A minimum 4-inch stubble height will be left on herbaceous vegetation within the riparian area along 11.1 miles of Red Canyon Creek in allotment #0634 at the end of the growing season as identified in the fisheries objective of the Owyhee RMP EIS.
4. Turn-out is subject to the Boise District range readiness criteria.
5. Your certified actual use report is due within 15 days of completing your authorized annual grazing use.
6. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
7. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
8. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
9. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
10. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
11. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late-fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
12. Utilization may not exceed 50 percent of the current year's growth.

United States District Court for the District of Idaho imposed terms and conditions

13. Key herbaceous riparian vegetation, where stream bank stability is dependent upon it, will have a minimum stubble height of 4 inches on the stream bank, along the greenline, after the growing season;
14. Key riparian browse vegetation will not be used more than 50 percent of the current annual twig growth that is within reach of the animals;
15. Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed more than 50 percent during the growing season, or 60 percent during the dormant season; and
16. Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

Table ALT-5: Mandatory and other terms and conditions of the offered permit for Teo & Sarah Maestrejuan to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 1 – Current Situation

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00634 Castlehead-Lambert	222	Cattle	4/15	9/30	100	Active	1,234

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the 1982 decision of the Boise District Manager and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
2. All cattle 6 months of age or older must be ear-tagged with assigned color and number on the Castlehead-Lambert allotment.
3. A minimum 4-inch stubble height will be left on herbaceous vegetation within the riparian area along 11.1 miles of Red Canyon Creek in allotment #0634 at the end of the growing season as identified in the fisheries objective of the Owyhee RMP EIS.
4. Turn-out is subject to the Boise District range readiness criteria.
5. Your certified actual use report is due within 15 days of completing your authorized annual grazing use.
6. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
7. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
8. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
9. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
10. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
11. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
12. Utilization may not exceed 50 percent of the current year's growth

United States District Court for the District of Idaho imposed terms and conditions

13. Key herbaceous riparian vegetation, where stream bank stability is dependent upon it, will have a minimum stubble height of 4 inches on the stream bank, along the greenline, after the growing season;
14. Key riparian browse vegetation will not be used more than 50 percent of the current annual twig growth that is within reach of the animals;
15. Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed more than 50 percent during the growing season, or 60 percent during the dormant season; and
16. Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

2.8.1.2 Alternative 2 – Castlehead-Lambert Allotment

Under Alternative 2, BLM would renew livestock grazing permits in accordance with terms and conditions within the application received from the 06 Livestock Company on August 11, 2011, as in the application received from the Collins Ranch, LLC, on June 29, 2011, and as both applications were revised by a document dated December 12, 2011, and received by BLM from Owyhee Range Service, representing the 06 Livestock Co., and the Collins Ranch, LLC. Transfer of the grazing permit held by Collins Ranch, LLC to Teo and Sarah Maestrejuan was completed July 19, 2012. No changes in the application for grazing permit renewal were requested at the time of grazing permit transfer.

Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would not be included in terms and conditions of the offered permits. The complete application received from Owyhee Range Service is reproduced in Appendix E.

The 06 Livestock Co. would be offered a 10-year grazing permit with an active use of 2,545 AUMs, and the Teo & Sarah Maestrejuan would be offered a 10-year grazing permit with an active use of 1,733 AUMs, as outlined in Table ALT-6. The alternative includes a conversion of approximately one-half of the suspension AUMs held by each permittee to active use AUMs. This would be an increase of 1,333 active use AUMs when compared to Alternative 1 – Current Situation, with the increase in active use AUMs being the result of increasing livestock numbers while retaining the same period of use for the allotment.

Table ALT-6: Permitted grazing use within the Castlehead-Lambert allotment with implementation of the Alternative 2 – Applicants' Proposed Action

Permittee	Active Use	Suspension	Permitted Use
06 Livestock Co.	2,545 AUMs	642 AUMs	3,187 AUMs
Teo & Sarah Maestrejuan	1,733 AUMs	404 AUMs	2,137 AUMs

Livestock grazing treatments and flexibility by pasture would be implemented consistent with information listed in Table ALT-7 and the discussion following the table identifying the 2-year pasture rotation. Any changes in management that are beyond the flexibility would require approval by the authorized officer.

Table ALT-7: Flexibility in cattle move dates among pastures of Castlehead-Lambert allotment

Pasture		# Cattle	# Days	Approximate # AUMs	Avg. stocking density*
4	Lambert Table	760	40 ± 10	750 – 1,250	11.8
2	Carter Springs	760	33 ± 9	600 – 1,050	11.1
3	Red Basin	760	41 ± 10	775 – 1,275	11.1
1	Castlehead	760	16 ± 5	275 - 525	10.0
6	Between-the-Canyons	760	31 ± 9	550 – 1,000	10.2
5	Horse	Discretionary	8	150 - 200	10.0
Discretionary Horse Use					
Pasture		**# Horses**	**# Days**	**# AUMs**	**Avg. stocking density**
5	Horse	10	Discretionary	56	N/A

* Stocking densities in this table are data included in the application received from the permittee. Stocking rates for public land within each pasture are provided in Appendix D.

Pasture 4 would be scheduled for early spring use annually for 40 days, give or take 10 days, beginning April 15. Grazing would generally end on May 24 but could be extended up to June 3 when favorable growing conditions would allow full regrowth and seed production after grazing ends. In years that unfavorable weather prevents use of pasture 4 at turnout (April 15), livestock would be turned out in either pasture 2 or pasture 3. Livestock could be held in the alternative turnout pasture (pasture 2 or 3) up to 14 days before moving to pasture 4. Time spent in the alternate turnout pasture would be considered during the scheduled use of that pasture.

Pastures 2 and 3 would be scheduled 2nd and 3rd in the rotation. The sequence of use of these two pastures would alternate in consecutive years so that each of these two pastures would receive alternate-year deferment from grazing use until later in the grazing season. Pasture 2 would be scheduled for 33 days of grazing use, give or take nine days, and pasture 3 would be scheduled for 41 days, give or take 10 days.

Grazing use of pastures 1 and 6 would be deferred annually until late in the grazing season. The sequence of use of pastures 1 and 6 would alternate annually. Pasture 1 would be scheduled for 16 days of grazing use, give or take 5 days, and pasture 6 would be scheduled for 31 days, give or take 7 days.

The grazing schedule above with terms of flexibility provides opportunity for use of pastures in the Castlehead-Lambert allotment as listed in Table ALT-8. Appendix H provided additional detail of the calculation of the dates listed in Table ALT-8.

Table ALT-8: Dates of possible use of pastures in the Castlehead-Lambert allotment under Alternative 2 and with implementation of flexibility

Pasture		Earliest on-date	Latest off-date	Maximum days of use
4	Lambert Table	4/15	6/17	50
2	Carter Springs	4/15	9/18	42
3	Red Basin	4/15	9/19	51
1	Castlehead	7/8	9/30	21
6	Between-the-Canyons	7/8	9/30	40
5	Horse	4/8	9/22	168

Mandatory and other terms and conditions of the offered permits for grazing use within the Castlehead-Lambert allotment would be defined as listed in Table ALT-9.

Table ALT-9: Mandatory and other terms and conditions of the offered permit to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 2 – Applicants' Proposed Action

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
06 Livestock Co.							
00634 Castlehead-Lambert	448	Cattle	4/15	9/30	100	Active	2,489
	10	Horse	4/8	9/22	100	Active	56
Teo & Sarah Maestrejuan							
00634 Castlehead-Lambert	312	Cattle	4/15	9/30	100	Active	1,733

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing within the Castlehead-Lambert allotment (#00634) will be in accordance with the Final Grazing decision of the Owyhee Field Manager, dated ________________________.
2. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5) for each allotment. The completed form(s) must be submitted to the Owyhee Field Office within 15 days from the last day of your authorized annual grazing use.
3. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4)-mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development. Special supplements intended to achieve livestock distribution would require prior approval.
4. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
5. Livestock grazing is not authorized in exclosures within the Castlehead-Lambert allotment (#00634).
6. Livestock turnout dates are subject to the Boise District range readiness criteria.

2.8.1.3 Alternative 3 – Castlehead-Lambert Allotment

Under Alternative 3, terms and conditions of grazing permits would identify intensities of livestock use that would be used to limit adverse impacts from livestock grazing on resource values. BLM would renew the two permits to graze livestock within the Castlehead-Lambert allotment with the same terms and conditions for livestock numbers, scheduled beginning and end dates for use of the allotment, pasture rotations, pasture seasons of use, and active use AUMs, as those in the replaced permits. However, in order to meet rangeland health standards and ORMP management objectives on the allotment, performance based terms and conditions would be added to the permits (see terms and conditions # 12-14 below and Table Alt-1 in section 2.3). The performance-based terms and conditions would limit utilization during the active growing season for upland perennial bunchgrasses, require mandatory stubble heights in riparian areas, place hard limits on stream bank alteration and woody browse use, and impose perennial herbaceous vegetation height requirements for uplands in important sage-grouse habitat. Upon failure to meet any one performance-based term and condition in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

The 06 Livestock Co. and the Teo & Sarah Maestrejuan would each be offered a 10-year grazing permit with active use of 1,915 AUMs and 1,329 AUMs respectively, as outlined in Table ALT-10.

Table ALT-10: Permitted grazing use within the Castlehead-Lambert allotment with implementation of Alternative 3 – Performance-based

Permittee	Active Use	Suspension	Permitted Use
06 Livestock Co.	1,915	1,272	3,187
Teo & Sarah Maestrejuan	1,329	808	2,137

The 6-year pasture rotation schedule implemented since 1982 and identified in Table ALT-11 would continue to be a term and condition of the permits offered. Active grazing use authorized would be unchanged from current permits.

Table ALT-11: Castlehead-Lambert allotment grazing schedule with implementation of Alternative 3 – Performance-based

Pasture		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1&6	Castlehead*	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30
2	Carter Spring	5/21 to 7/7	Rest	5/21 to 7/7	4/16 to 5/20	5/21 to 7/7	Rest
3	Red Basin	4/16 to 5/20	5/21 to 7/7	Rest	5/21 to 7/7	Rest	5/21 to 7/7
4	Lambert Table	Rest	4/16 to 5/20	4/16 to 5/20	Rest	4/16 to 5/20	4/16 to 5/20
5	Horse	Used in conjunction with Pasture 3 or with domestic horses in accordance with permits.					

*Pasture 1 - Castlehead was divided in 2005 to create Pasture 1 - Castlehead and Pasture 6 - Between-the-Canyons pastures. Scheduled use would remain unchanged from the 1982 schedule, planned 7/8 to 9/30 annually for both pastures.

Mandatory and other terms and conditions of the offered permits for grazing use in the Castlehead-Lambert allotment would be defined as listed in Table ALT-12 and Table ALT-13.

Table ALT-12: Mandatory and other terms and conditions of the offered permit for the 06 Livestock Co. to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 3 – Performance-based

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00634 Castlehead-Lambert	334	Cattle	4/15	9/30	100	Active	1,856
	10	Horse	4/8	9/30	100	Active	58

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the 1982 decision of the Boise District Manager and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Flexibility is provided to allow seven days to complete moves between pastures. Changes to the scheduled use require approval
2. Turn-out is subject to the Boise District range readiness criteria.
3. Your certified actual use report is due within 15 days of completing your authorized annual grazing use.
4. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
8. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
9. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
10. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
11. Utilization may not exceed 50 percent of the current year’s growth.
12. **Performance-based terms and conditions:** Grazing permit terms and conditions 13 through 15 are performance-based terms and conditions which require the permittee to implement livestock management practices to limit impacts to resource attributes (Table ALT-1). These terms and conditions are included in this permit to meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and ORMP objectives. Upon failure to meet any one performance-based term and condition in the allotment in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.
13. Seasonal utilization within pastures scheduled for grazing use between May 1 and July 1 may not exceed the slight category (≤ 20 percent) (Key Species Method).
14. Riparian stubble height of hydric species may not be less than 6 inches within lotic and lentic riparian areas at the end of the grazing season. Woody browse utilization may not be greater than 30 percent within lotic and lentic riparian areas at the end of the grazing season. Stream bank alternation within lotic riparian areas may not be greater than 10 percent at the end of scheduled livestock grazing. Edge shear within lentic riparian areas may not be greater than 20 percent at the end of scheduled livestock grazing.
15. Native perennial herbaceous vegetation height may not be less than 7 inches post-grazing within PPH-sagebrush in pastures 2 and 4 when grazing use is scheduled between March 15 and June 15 or less than 4 inches post-grazing within PPH-sagebrush in these pastures when grazing use is scheduled at times other than between March 15 and June 15.

Table ALT-13: Mandatory and other terms and conditions of the offered permit for the Teo & Sarah Maestrejuan to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 3 – Performance-based

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00634 Castlehead-Lambert	238	Cattle	4/15	9/30	100	Active	1,323

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the 1982 decision of the Boise District Manager and restated in the final decision of the Owyhee Field Office Manager dated _________________________. Flexibility is provided to allow seven days to complete moves between pastures. Changes to the scheduled use require approval
2. Turn-out is subject to the Boise District range readiness criteria.
3. Your certified actual use report is due within 15 days of completing your authorized annual grazing use.
4. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
8. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
9. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
10. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
11. Utilization may not exceed 50 percent of the current year's growth.
12. **Performance-based terms and conditions:** Grazing permit terms and conditions 13 through 15 are performance-based terms and conditions which require the permittee to implement livestock management practices to limit impacts to resource attributes (Table ALT-1). These terms and conditions are included in this permit to meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and ORMP objectives. Upon failure to meet any 1 performance-based term and condition in the allotment in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.
13. Seasonal utilization within pastures scheduled for grazing use between May 1 and July 1 may not exceed the slight category (≤ 20 percent) (Key Species Method).
14. Riparian stubble height of hydric species may not be less than 6 inches within lotic and lentic riparian areas at the end of the grazing season. Woody browse utilization may not be greater than 30 percent within lotic and lentic riparian areas at the end of the grazing season. Stream bank alternation within lotic riparian areas may not be greater than 10 percent at the end of scheduled livestock grazing. Edge shear within lentic riparian areas may not be greater than 20 percent at the end of scheduled livestock grazing.
15. Native perennial herbaceous vegetation height may not be less than 7 inches post-grazing within PPH-sagebrush in pastures 2 and 4 when grazing use is scheduled between March 15 and June 15 or less than 4 inches post-grazing within PPH-sagebrush in these pastures when grazing use is scheduled at times other than between March 15 and June 15.

2.8.1.4 Alternative 4 – Castlehead-Lambert Allotment

Under Alternative 4, seasons of grazing use would be used to limit adverse impacts from livestock grazing on resource values. BLM developed Alternative 4 – Season-based with constraints on periods when grazing would be authorized specific to sage-grouse habitats, upland perennial vegetation communities, or riparian resources present within each pasture. In order to meet rangeland health standards and ORMP management objectives on the allotment, these constraints were used to define a grazing schedule for pastures of the Castlehead-Lambert allotment that would address issues identified in the evaluation report for the Castlehead-Lambert allotment by defining seasons of grazing use appropriate to maintain or improve specific resource values (USDI BLM, 2012a). The grazing schedule would limit livestock management practices in the Castlehead-Lambert allotment to provide more frequent opportunity for recovery of sagebrush steppe bunchgrass species following active growing season[15] grazing use, soil protection to support upland hydrologic function and soil/site stability, breeding habitat for sage-grouse (pre-laying, nesting and early brood-rearing), and lentic and lotic riparian function. Constraints used to develop the grazing schedule are provided in Table ALT-14.

Table ALT-14: Resource-based constraints used to develop the season-based grazing schedule for pastures within the Castlehead-Lambert allotment

<table>
<tr><th>Resource</th><th>Pasture 1 Castlehead</th><th>Pasture 6 Between the Canyons</th><th>Pasture 2 Carter Spring</th><th>Pasture 3 Red Basin</th><th>Pasture 4 Lambert Table</th><th>Pasture 5 Horse</th></tr>
<tr><td>Sage Grouse Habitats/</td><td colspan="4">No constraint</td><td>Grazing use no more than 1 in any 3 consecutive years during the breeding season (April 15 through June 15)</td><td>No constraint</td></tr>
<tr><td>Upland Vegetation And Soils</td><td colspan="6">Grazing use no more than 1 in 2 consecutive years during the active growing season (May 1 through July 1)</td></tr>
<tr><td>Riparian</td><td colspan="3">No use 7/1 through 9/15</td><td colspan="2">No constraint</td><td>No use 7/1 through 9/15</td></tr>
</table>

Livestock grazing during the active growing season (May 1 through July 1) for native perennial bunchgrass species would be limited to no more than 1 in 2 consecutive years to improve and maintain the health of native perennial herbaceous species, as well as to provide vegetative cover and litter deposition for soil protection. Because pasture 4 provides PPH-sagebrush for sage-grouse, livestock grazing within the pasture would be limited to no more than 1 in any 3 consecutive years during the breeding season (April 15 through June 15). Livestock would be excluded from pastures 1, 2, and 6 between July 1 and September 15 in all years to allow recovery of non-functioning or functioning-at-risk riparian areas and maintenance of riparian areas in proper functioning condition.

The grazing schedule identified in Table ALT-15 would be established for pastures in the Castlehead-Lambert allotment and made a term and condition of the grazing permit. The schedule would implement

[15] The active growing season for bluebunch wheatgrass, Idaho fescue, and other native perennial bunchgrass species within vegetation communities of Castlehead-Lambert allotment is May 1 to July 1, a period when decreasing soil moisture does not provide opportunity for new tiller formation and regrowth before the dormant period.

the pasture constraints identified above in Table ALT-14. Flexibility is provided within the schedule for the mid-season moves to and from pasture 4 so that the schedule can still be implemented in years when livestock water is limited or not available in pasture 4.

Table ALT-15: Grazing schedule for pastures of the Castlehead-Lambert allotment with implementation of Alternative 4 – Season-based

Pasture Number	Pasture Name	Year 1	Year 2
1	Castlehead	6/1 – 6/30	9/16 to 9/30
2	Carter	4/15 – 5/31	4/15 – 4/30
3	Red Basin	*7/1 – 9/15	*7/1 – 9/15
4***	Lambert Table	*7/1 – 7/31	*7/1 – 7/31
5	Horse	**Transition	**Transition
6	Between-the-Canyons	9/16 to 9/30	5/1 – 6/30

* Although dates of use overlap between two pastures, the integrity of pasture management units would be maintained with gates closed. Flexibility is provided to adjust the livestock move date into the Lambert Table (flexibility to begin grazing use prior to 7/1) and Red Basin pastures based on climatic conditions and livestock water availability, so long as scheduled deferment of upland range (no earlier than July 1) occurs in at least 1 in each 2-year period (both pastures) and scheduled deferment of sage-grouse breeding habitat (no earlier than June 20) occurs in at least 1 in each 3-year period (Lambert Table).
** Cattle use of the Horse Pasture is restricted to overnight holding of cattle in years when the next scheduled pasture does not require deferment of use for maintenance of upland vegetation vigor and up to seven days of use when the next scheduled pasture does require deferment. Domestic horse use, as identified in permits, would be limited to the Horse pasture.
*** The grazing schedule for the Lambert Table pasture recognizes the limited water available to support livestock use, especially as the grazing season progresses, and does not define a period when the Lambert Table pasture is the only pasture available for use. In years when livestock water is available, flexibility for grazing use is provided.

Under the season-based alternative, BLM would set the stocking rate for the Castlehead-Lambert allotment at 10 acres per AUM within the pasture most limited by the number of cattle and duration of scheduled use upon implementation of the grazing schedule[16] (see Appendix D). Ten acres per AUM is consistent with current stocking rates that were identified as not a cause for failure to meet rangeland health standards or management objectives (USDI BLM, 2012a). Additionally, 10 acres per AUM stocking rate is a conservative stocking rate consistent with ecological site potential within the allotment, as limited by inventoried condition, water availability, and topography[17].

The 06 Livestock Co. would be offered a 10-year grazing permit with an active use of 1,245 AUMs, and Teo & Sarah Maestrejuan would be offered a 10-year grazing permit with an active use of 856 AUMs, as outlined in Table ALT-16. As a result of the constraint in periods when pastures with sage-grouse habitats, upland perennial vegetation communities, or riparian resources would be available for grazing use, the alternative includes the elimination of 1,143 active use AUMs from permitted use.

[16] If BLM were to implement actions to maximize livestock use of forage production, approximately 4.5 acres would be required to support 1 AUM in the Castlehead-Lambert allotment in a normal year, assuming ideal conditions with forage production from all ecological sites at potential, equal livestock distribution throughout the allotment, and utilization at 50 percent of grass and grass-like species. These ideal conditions are not present within the Castlehead-Lambert allotment. Vegetation inventories identify most sites within the allotment in an ecological status less than potential natural condition. Equal distribution of livestock is limited by topography, distance from water, and other natural factors that do not allow an even 50 percent utilization in all portions of each pasture. In addition, measured utilization includes vegetation removed by native herbivores, including insects. Finally, management objectives to sustain resource values in addition to forage production often do not allow opportunity to maximize use of forage produced for livestock production. With current management, pasture 4 is scheduled to have the greatest number of acres (17.5 acres) to support 1 AUM during all years of the pasture rotations, and pastures 1 and 6 are scheduled to have the least number of acres (7.5 acres) to support 1 AUM in all years.

[17] See analysis of Alternative 1, Rangeland Vegetation for the Castlehead-Lambert allotment

Table ALT-16: Permitted grazing use within the Castlehead-Lambert allotment with implementation of Alternative 4 – Season-based

Permittee	Active Use	Suspension	Permitted Use
06 Livestock Co.	1,245 AUMs	1,272 AUMs	2,517 AUMs
Teo & Sarah Maestrejuan	856 AUMs	808 AUMs	1,664 AUMs

Mandatory and other terms and conditions of the offered permits would be defined as listed in Table ALT-17.

Table ALT-17: Mandatory and other terms and conditions of the offered permits to graze livestock within the Castlehead-Lambert allotment with implementation of Alternative 4 – Season-based

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
06 Livestock Co.							
00634 Castlehead-Lambert	214	Cattle	4/15	9/30	100	Active	1,189
	10	Horse	4/8	9/22	100	Active	56
Teo & Sarah Maestrejuan							
00634 Castlehead-Lambert	154	Cattle	4/15	9/30	100	Active	856

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the final decision of the Owyhee Field Office Manager dated ________________________. Flexibility is provided to allow seven days to complete moves between pastures, so long as cattle grazing during the active growing season for native perennial bunchgrass species (May 1 to July 1) is limited to no more than 1 in each 2-year period, grazing within the Lambert Table pasture is deferred until after June 20 in 2 of each 3 years to provide breeding habitat for sage-grouse, and livestock grazing is excluded from pastures 1, 2, and 6 between July 1 and September 15 in all years to meet riparian management objectives. Cattle movement resulting from active trailing through these identified pastures with riparian resources is authorized between July 1 and September 15 in accordance with the grazing schedule. Grazing use of the Horse pasture is restricted to overnight holding of cattle in years when the next scheduled pasture does not require deferment of use for maintenance of upland vegetation vigor and up to 7 days of use when the next scheduled pasture does require deferment. Changes in scheduled pasture use dates will require prior authorization.
2. A minimum 4-inch stubble height will be left on herbaceous vegetation within the riparian area along 11.1 miles of Red Canyon Creek in allotment #0634 at the end of the growing season as identified in the fisheries objective of the Owyhee RMP EIS.
3. Turn-out is subject to the Boise District range readiness criteria.
4. Your certified actual use report is due within 15 days of completing your authorized annual grazing use.
5. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
6. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
7. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
8. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
9. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
10. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
11. Utilization may not exceed 50 percent of the current year's growth

2.8.1.5 Alternative 5 – Castlehead-Lambert Allotment

Under Alternative 5, no grazing would be authorized on public lands within the Castlehead-Lambert allotment for a term of 10 years. Applications for grazing permit renewal would be denied and no grazing permits would be offered. All 5,324 AUMs of permitted use on the Castlehead-Lambert allotment (3,244 AUMs active use; 2,080 AUMs suspension) would be cancelled and unavailable for livestock grazing on public lands. Upon expiration of the 10-year term, livestock grazing on the allotment would be reevaluated, with retention of preference (priority for grazing authorization) for approval of application(s) for grazing permit(s) attached to current base property(s).

2.8.2 Garat Allotment (0584)

2.8.2.1 Alternative 1 – Garat Allotment

Under Alternative 1, BLM would renew the permit to graze livestock within the Garat allotment with the same terms and conditions as those in the replaced permit, except for authorized livestock numbers and AUMs of active use. Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would continue to be terms and conditions of the offered permits. Alternative 1 would authorize grazing at levels equivalent to the maximum actual use reported since 2002 (Appendix B). The average actual use reported during the past ten years (2002 through 2011) for the Garat allotment has been 14,802 AUMs, with a maximum of 18,870 AUMs reported in 2006.

Livestock grazing would be authorized in accordance with the 1989 Management Agreement between Petan Company of Nevada, Inc., (Petan) and the BLM. Petan would be offered a 10-year grazing permit with an active use of 18,870 Animal Unit Months (AUMs), as outlined in Table ALT-18. The alternative includes the elimination of 630 active use AUMs and 3,250 voluntary nonuse AUMs from permitted use.

Table ALT-18: Permitted grazing use within the Garat allotment with implementation of Alternative 1 – Current Situation

Active Use	Suspension	Permitted Use
18,870 AUMs	10,896 AUMs	29,766 AUMs

The 6-year pasture rotation schedule implemented since 1989 and identified in Table ALT-19 would continue to be a term and condition of the permit. Flexibility in the established grazing schedule to adjust grazing annually due to climatic conditions and other factors, as identified in the terms and conditions of the permit and as implemented during the 10-year period between 2001 and 2010, would continue to be implemented (See Appendix B for a summary of actual use reported for the Garat allotment).

Table ALT-19: Garat allotment grazing schedule with implementation of Alternative 1 – Current Situation

Pasture Number	Pasture Name	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1	Dry Lake	3/15 to 6/15	Rest	3/15 to 6/15*	3/15 to 6/15	Rest	3/15 to 6/15*
2	Piute Creek	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15
3	Forty-Five	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15	Rest

Pasture Number	Pasture Name	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
4	Kimball	Rest	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15
5	Big Horse	8/1 to 9/30	8/1 to 9/30	6/16 to 9/30	8/1 to 9/30	8/1 to 9/30	6/16 to 9/30
6	Juniper Basin	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30

* Will be used 3/15 to 5/30 with 500-1,000 head on old feed (NW corner).
The permit provides for flexibility at the end of the grazing season for 250 head of strays 10/1 to 10/15.

Mandatory and other terms and conditions of the offered permit would be defined as listed in Table ALT-20

Table ALT-20: Mandatory and other terms and conditions of the offered permit to graze livestock within the Garat allotment with implementation of Alternative 1 – Current Situation

Allotment	Livestock		Grazing Period		% PL[2]	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00584 Garat	2,955	Cattle	03/15	09/30	96	Active	18,653
	250	Cattle	10/1	10/15	96	Active	118
	15	Horse	03/15	09/30	100	Active	99

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.
[2] The current permit recognizes 94 percent public land and included credit for private land within the Owyhee River Canyon controlled by Petan Company of Nevada, Inc. Lands within the Owyhee River Canyon were removed from the Garat allotment with implementation of the Owyhee Resource Management Plan, resulting in 96 percent public land identified in the permit that would be offered.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the 1989 Management Agreement and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
2. Your completed actual use report is due within 15 days of completing your authorized annual grazing use.
3. Salt and/or supplements shall not be placed within one-quarter (1/4) mile of springs, streams, meadows, aspen stands, playas, or water developments.
4. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
5. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
6. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permits in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
7. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
8. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
9. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
10. Utilization may not exceed 50 percent of the current year's growth.

United States District Court for the District of Idaho imposed terms and conditions

11. Key herbaceous riparian vegetation, where stream bank stability is dependent upon it, will have a minimum stubble height of 4 inches on the stream bank, along the greenline, after the growing season;
12. Key riparian browse vegetation will not be used more than 50 percent of the current annual twig growth that is within reach of the animals;
13. Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed more than 50 percent during the growing season, or 60 percent during the dormant season; and
14. Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

2.8.2.2 Alternative 2 – Garat Allotment

Under Alternative 2, BLM would renew the livestock grazing permit in accordance with terms and conditions within the application dated June 29, 2011 and as revised November 18, 2011 by Petan Company of Nevada, Inc. (Petan). Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would not be be included in terms and conditions of the offered permits. The complete application is reproduced in Appendix E. The complete application is reproduced in Appendix F.

Voluntary non-use of 3,250 AUMs identified in the 1989 Management Agreement would be restored to active use. Petan would be offered a grazing permit for a term of 10 years with an active use of 22,750 Animal Unit Months (AUMs) as outlined in Table ALT-21. This would be an increase of 3,250 active use AUMs from Alternative 1 – Current Situation, with the increase in AUMs being the result of increasing livestock numbers and also authorizing a beginning date for livestock grazing within the allotment two days earlier. The two-day earlier beginning date was requested to allow livestock to move through the allotment and arrive at the pastures scheduled to be first by the traditional beginning date of March 15.

Table ALT-21: Permitted grazing use within the Garat allotment with implementation of Alternative 2 – Applicant's Proposed Action

Active Use	Suspension	Permitted Use
22,750 AUMs	10,896 AUMs	33,646 AUMs

In accordance with the November 18, 2011, Modification of the Grazing Application for the Garat Allotment (#00584), the application for permit renewal received by BLM, the grazing schedule for pastures of the Garat allotment identified in Table ALT-22 would be authorized.

Table ALT-22: Garat allotment grazing strategy with implementation of Alternative 2 – Applicant's Proposed Action

Pasture	Scheduled Use				
Dry Lake 1	Spring	3/15 to 7/30			
Dry Lake 2	Spring	3/15 to 7/30			
Forty-Five	Spring	3/15 to 7/30			
Big Horse	Spring	3/15 to 7/30			
Kimball	Flexible	3/15 to 7/30	or		5/16 to 9/30
Juniper Basin				Summer	5/16 to 9/30

- Graze at least two of the spring pastures between 3/15 and 5/15 each year.
- Rest each of the spring pastures at least once every 3 years.
- If permittee determines that mid-season water is adequate, use one to three of the spring pastures longer (as late as 7/30), otherwise use Kimball during the spring period.
- If permittee determines that mid-season water is adequate in spring pastures, the Kimball and/or Juniper Basin pastures may be deferred until after 7/15, or rested.
- Defer the Kimball pasture at least once every 3 years, or rest it once every 5 years.
- If mid-season water is scarce in spring pastures, graze the Juniper Basin pasture (and Kimball when needed) between 5/16 and 9/30, distributing cattle as needed.
- Management flexibility for strays: Not to exceed 250 head from 10/1 to 10/15.

Grazing use adjustment protocols would be implemented to use short-term monitoring (maximum allowable average utilization level of 50 percent) and long-term monitoring (trend and ecological status, water quality and riparian conditions, and wildlife habitat and special status species habitat or populations) to adjust livestock stocking rates or active AUMs. A 5-year evaluation cycle would be used to identify appropriate increases or decreases in stocking rates based on short-term and long-term monitoring if livestock management is a contributing factor to not meeting allotment-specific management objectives. Allotment-specific management objectives are derived from ORMP management objectives. Increases in stocking rates within the allotment would be limited to a 10 percent increase at each 5-year interval for evaluations, not to exceed a maximum stocking rate that would result from the restoration of 10,896 AUMs of suspension restored to active use. The complete application received by the BLM (Appendix F) includes details of the protocols for identifying when increases in livestock active use AUMs are provided.

Mandatory and other terms and conditions of the offered permit would be defined as listed in Table ALT-23.

Table ALT-23: Mandatory and other terms and conditions of the offered permit to graze livestock within the Garat allotment with implementation of Alternative 2 – Applicant's Proposed Action

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00584 Garat	3,522	Cattle	03/13	09/30	96	Active	22,454
	250	Cattle	10/1	10/15	96	Active	118
	25	Horse	03/14	10/14	100	Active	177

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

- Line 1 reflects a season of use for Garat allotment of March 15 through September 30, with two days (March 13-14) approved for cattle movement through the allotment to allow the cattle to reach the Forty-Five and Dry Lake pastures by March 15.
- Line 2 reflects management flexibility for removing strays (not to exceed 250 head between October 1 and October 15) after the scheduled grazing season.
- Line 3 reflects an average of 25 saddle horses authorized to graze between March 14 and October 14 within the horse fields located near Stateline Camp, Four Corners Camp, and/or Piute Creek Camp. Approximately 15 saddle horses reside at one of these camps season-long. While saddle horse numbers can increase to 75 head during periods when cattle are being gathered, moved between pastures, and/or branded.
- Lines 1-3 total 22,749 AUMs, consistent with the 22,750 active use AUMs preference (sic) specified by the approved Owyhee Resource Management Plan dated December 30, 1999. Petan preference (sic) within the Garat allotment includes 10,896 suspended AUMs for a total preference (sic) of 33,646 AUMs.

Terms and conditions:

1. All grazing use will be in accordance with the provisions set forth in Attachment A to the November 18, 2011, Modification of the Grazing Application for the Garat allotment (#00584). Attachment A serves as the functional equivalent of an Allotment Management Plan for the Garat allotment.
2. Livestock turnout dates are subject to the following Range Readiness criteria: Range readiness is defined as the point when the soils have firmed after the spring thaw, when squirrel-tail (SIHY) has at least 2 inches of new growth, and bluebunch wheatgrass (AGSP) has at least 4 inches of new growth. When these parameters are reached, the rangelands in the Garat allotment are considered ready for livestock use, the plants having achieved a growth stage that enables them to maintain themselves. Pastures with substantial old feed may be used before these limits are reached once the soils have firmed, after mutual agreement with the BLM.
3. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5, or equivalent) for each allotment. The completed form(s) must be submitted to the Owyhee Field Office within 15 days from the last day of your authorized annual grazing use.
4. You will be annually billed for your grazing use after-the-fact based upon your "as filled" Actual Grazing Use Report Form, or its equivalent.
5. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4) mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development.
6. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.

2.8.2.3 Alternative 3 – Garat Allotment

Under Alternative 3, terms and conditions of grazing permits would identify intensities of livestock use that would be used to limit adverse impacts from livestock grazing on resource values. BLM would renew the permit to graze livestock within the Garat allotment with the same terms and conditions for livestock numbers, scheduled beginning and end dates for use of the allotment, pasture rotations, pasture seasons of use, and active use AUMs, as those in the replaced permits. However, in order to meet rangeland health standards and ORMP management objectives on the allotment, performance based terms and conditions would be added to the permits (see terms and conditions # 13-16 below and Table Alt-1 in section 2.3). The performance-based terms and conditions would limit utilization during the active growing season for upland perennial bunchgrasses, require mandatory stubble heights in riparian areas, place hard limits on streambank alteration and woody browse use, and impose perennial herbaceous vegetation height requirements for uplands in important sage-grouse habitat. Upon failure to meet any one performance-based term and condition in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

Terms and conditions of the current grazing permit defined in the 1989 Management Agreement between Petan and the BLM would be included in the offered grazing permit. Petan would be offered a 10-year grazing permit with an active use of 19,500 AUMs as outlined in Table ALT-24. The alternative includes no change in the active use AUMs or suspension AUMs held by the permittee, but does includes the elimination of 3,250 voluntary nonuse AUMs from permitted use.

Table ALT-24: Permitted grazing use within the Garat allotment with implementation of Alternative 3 – Performance-based

Active Use	Suspension	Permitted Use
19,500 AUMs	10,896 AUMs	30,396 AUMs

The 6-year pasture rotation schedule implemented since 1989 and identified in Table ALT-25 would continue to be a term and condition of the permit. Flexibility would be provided to allow 7 days to complete moves between pastures.

Table ALT-25: Garat allotment grazing schedule with implementation of Alternative 3 – Performance-based

Pasture Number	**Pasture Name**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1	Dry Lake	3/15 to 6/15	Rest	3/15 to 6/15*	3/15 to 6/15	Rest	3/15 to 6/15*
2	Piute Creek	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15
3	Forty-Five	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15	Rest
4	Kimball	Rest	3/15 to 6/15	3/15 to 6/15	Rest	3/15 to 6/15	3/15 to 6/15
5	Big Horse	8/1 to 9/30	8/1 to 9/30	6/16 to 9/30	8/1 to 9/30	8/1 to 9/30	6/16 to 9/30
6	Juniper Basin	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30	6/16 to 9/30

* - Will be used 3/15 to 5/30 with 500-1,000 head on old feed (NW corner).
The permit provides for flexibility at the end of the grazing season for 250 head of strays 10/1 to 10/15.

Mandatory and other terms and conditions of the offered permit for grazing use in the Garat allotment would be defined as listed in Table ALT-26.

Table ALT-26: Mandatory and other terms and conditions of the offered permit to graze livestock within the Garat allotment with implementation of Alternative 3 – Performance-based

Allotment	Livestock		Grazing Period		% PL[2]	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00584 Garat	3,054	Cattle	03/15	09/30	96	Active	19,278
	250	Cattle	10/1	10/15	96	Active	118
	15	Horse	03/15	09/30	100	Active	99

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.
[2] The current permit recognizes 94 percent public land and included credit for private land within the Owyhee River Canyon controlled by Petan Company of Nevada, Inc. Lands within the Owyhee River Canyon were removed from Garat Allotment with implementation of the Owyhee Resource Management Plan, resulting in 96 percent public land identified in the permit. The change to percent public land results in the number of livestock in Line 1 reduced from the current permit while retaining the flexibility for 250 head of cattle in Line 2.

Terms and conditions:

1. Grazing use will be in accordance with terms and conditions, including the grazing schedule, identified in the 1989 Management Agreement and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Flexibility is provided to allow seven days to complete moves between pastures. Changes to the scheduled use require prior approval.
2. Turnout is subject to Boise District range readiness criteria.
3. Your completed actual use report is due within 15 days of completing your authorized annual grazing use.
4. Salt and/or supplements shall not be placed within one -quarter (1/4) mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permits in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
8. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
9. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
10. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
11. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
12. Utilization may not exceed 50 percent of the current year's growth.
13. **Performance-based terms and conditions:** Grazing permit terms and conditions 14 through 16 are performance-based terms and conditions which require the permittee to implement livestock management practices to limit impacts to resource attributes. These terms and conditions are included in this permit to meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and ORMP objectives. Upon failure to meet any 1 performance-based term and condition in the allotment in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.
14. Seasonal utilization within pastures scheduled for grazing use between May 1 and July 1 may not exceed the slight category (≤ 20 percent) (Key Species Method).
15. Riparian stubble height of hydric species may not be equal to or less than 6 inches within lotic and lentic riparian areas at the end of the grazing season. Woody browse utilization may not be greater than 30 percent within lotic and lentic riparian areas at the end of the grazing season. Stream bank alternation within lotic riparian areas may not be greater than 10 percent at the end of scheduled livestock grazing. Edge shear within lentic riparian areas may not be greater than 20 percent at the end of scheduled livestock grazing.
16. Native perennial herbaceous vegetation height may not be less than 7 inches post-grazing within PPH-sagebrush in all pastures when grazing use is scheduled between March 15 and June 15 or less than 4 inches post-grazing within PPH-sagebrush when grazing use is scheduled at times other than between March 15 and June 15.

2.8.2.4 Alternative 4 – Garat Allotment

Under Alternative 4, seasons of grazing use would be used to limit adverse impacts from livestock grazing on resource values. BLM developed Alternative 4 – Season-based with constraints on periods when grazing would be authorized specific to sage-grouse habitats or upland perennial vegetation communities within each pasture. In order to meet rangeland health standards and ORMP management objectives on the allotment, these constraints would be used to define a grazing rotation for the Garat allotment that would address issues identified in the evaluation report for the Garat allotment by defining seasons of grazing use appropriate to maintaining or improving specific resource values (USDI BLM, 2012b). The grazing schedule would limit livestock management practices in the Garat allotment to provide more frequent opportunity for recovery of sagebrush steppe bunchgrass species following active growing season[18] grazing use, soil protection to support upland hydrologic function and soil/site stability, and breeding habitat for sage-grouse (pre-laying, nesting and early brood-rearing). Constraints used to develop the grazing schedule are provided in Table ALT-27.

Table ALT-27: Resource based constraints used to develop the Season-based grazing schedule for the Garat allotment

Resource	**Pastures 1-6**
Sage grouse	Grazing use no more than 1 in 3 years during the sage-grouse breeding season (April 15 through June 15)
Vegetation and Soils	Grazing use no more than 1 in 3 years during the active growing season for upland bunchgrass species (May 1 through July 1)

Livestock grazing during the active growing season (May 1 through July 1) for native perennial bunchgrass species would be limited to no more than 1 in each 3 consecutive years to improve and maintain the health of native perennial herbaceous species, as well as to provide vegetative cover and litter deposition for soil protection. All pastures provide PPH-sagebrush for sage-grouse and therefore livestock grazing would be limited to no more than 1 in any 3 consecutive years during the breeding season (April 15 through June 15).

The grazing schedule identified in Table ALT-28 would be established for pastures in the Garat allotment and made a term and condition of the grazing permit. The schedule would implement the pasture constraints identified above in Table ALT-27. Flexibility would be provided within the schedule for use of multiple pastures after 7/1. Additional flexibility would be provided to allow 7 days to complete moves between pastures, as long as scheduled deferment of grazing use outside the lekking, nesting, and early brood-rearing season for sage-grouse (4/15 to 6/15) is implemented in 2 of each 3-year period and scheduled deferment of grazing use outside the upland vegetation active growing season (5/1 to 7/1) is implemented in 2 years of each 3-year cycle.

[18] The active growing season for bluebunch wheatgrass, Idaho fescue, and other native perennial bunchgrass species within vegetation communities of Garat allotment is May 1 to July 1, a period when decreasing soil moisture does not provide opportunity for new tiller formation and regrowth before the dormant period.

Table ALT-28: Garat allotment grazing schedule with implementation of Alternative 4 – Season-based

Pasture	Pasture Name	Year 1	Year 2	Year 3
1	*Dry Lake	3/15-4/15	3/15-4/15	3/15-4/15
2	*Piute Creek			
3	Forty-Five	**7/1 to 10/15	**7/1 to 10/15	**4/16 to 10/15
4	Kimball	**7/1 to 10/15	**4/16 to 10/15	**7/1 to 10/15
5	***Big Horse	**4/16 to 10/15	**7/1 to 10/15	**7/1 to 10/15
6	Juniper Basin	**4/16 to 10/15	**7/1 to 10/15	**7/1 to 10/15

* Dry Lake and Piute Creek will be managed as one unit as a result of a lack of a barrier to livestock movement between the pastures.
** Although dates of use overlap between pastures, the intent of the grazing schedule is to provide flexibility while maintaining orderly administration of grazing use within each pasture. Pastures will be maintained as separate livestock management units without open gates allowing drift between pastures. Flexibility is provided to adjust the livestock move dates based on climatic conditions and water availability as long as scheduled dates of periodic non-use to provide sage-grouse breeding habitat and upland vegetation growing season deferment are provided.
*** The grazing schedule for the Big Horse pasture recognizes the limited water available to support livestock use, especially as the grazing season progresses, and does not define a period when the Big Horse pasture is the only pasture available for use. In years when livestock water is available, flexibility for grazing use is provided. Although Big Horse pasture is identified in the grazing schedule with use between 4/16 and 7/1 consistent with use of Juniper Basin pasture, flexibility is provided for concurrent use with either Forty-Five or Kimball pastures, so long as the scheduled deferment occurs for maintenance of upland vegetation and for providing sage-grouse breeding habitat.

Under the season-based alternative, BLM would set the stocking rate for the Garat allotment at 10 acres per AUM within the pasture most limited by the number of cattle and duration of scheduled use[19] (see Appendix D). Ten acres per AUM is consistent with current stocking rates that were identified as not a cause for failure to meet rangeland health standards or management objective (USDI BLM, 2012b). Additionally, the 10 acres per AUM stocking rate is conservative stocking rate consistent with ecological site potential within the allotment, as limited by inventoried condition, water availability, and topography[20].

Petan Company of Nevada, Inc. would be offered a grazing permit for a term of 10 years with an active use of 10,343 Animal Unit Months (AUMs) as outlined in Table ALT-29. As a result of the constraint in periods when pastures with sage-grouse habitats or upland perennial vegetation communities would be available for grazing use, the alternative includes the elimination of 9,157 active use AUMs and 3,250 voluntary nonuse AUMs from permitted use.

[19] If BLM were to implement actions to maximize livestock use of forage production, approximately 4.8 acres would be required to support 1 AUM in the Garat allotment in a normal year, assuming ideal conditions with forage production from all ecological sites at potential, equal livestock distribution throughout the allotment, and utilization at 50 percent of grass and grass-like species. These ideal conditions are not present within the Garat allotment. Vegetation inventories identify most sites within the allotment in an ecological status less than potential natural condition. Equal distribution of livestock is limited by topography, distance from water, and other natural factors that do not allow an even 50 percent utilization in all portions of each pasture. In addition, measured utilization includes vegetation removed by native herbivores, including insects. Finally, management objectives to sustain resource values in addition to forage production often do not allow opportunity to maximize use of forage produced for livestock production. With current management, pasture 3 is scheduled to have the greatest number of acres (14.3 acres) to support 1 AUM during all years of the pasture rotations, and pasture 6 is scheduled to have the least number of acres (6.5 acres) to support 1 AUM in all years.
[19] See analysis of Alternative 1, Rangeland Vegetation for the Garat allotment
[20] See analysis of Alternative 1, Rangeland Vegetation for the Garat allotment

Table ALT-29: Permitted grazing use within the Garat allotment with implementation of the Alternative 4-Season-based

Active Use	Suspension	Permitted Use
10,343 AUMs	10,896	21,239 AUMs

Mandatory and other terms and conditions of the offered permit for grazing use in the Garat allotment would be defined as listed in Table ALT-30.

Table ALT-30: Mandatory and other terms and conditions of the offered permit to graze livestock within the Garat allotment with implementation of Alternative 4 – Season-based

Allotment	Livestock		Grazing Period		% PL[2]	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00584 Garat	1,604	Cattle	03/15	09/30	96	Active	10,126
	250	Cattle	10/1	10/15	96	Active	118
	15	Horse	03/15	09/30	100	Active	99

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.
[2] The current permit recognizes 94 percent public land and included credit for private land within the Owyhee River Canyon controlled by Petan Company of Nevada, Inc. Lands within the Owyhee River Canyon were removed from Garat Allotment with implementation of the Owyhee Resource Management Plan, resulting in 96 percent public land identified in the permit.

Terms and conditions:

1. Grazing use will be in accordance with the grazing schedule identified in the final decision of the Owyhee Field Office Manager dated _________________________. Flexibility is provided to allow seven days to complete moves between pastures, so long as scheduled deferment is implemented to avoid grazing use prior to 7/1 in two of each three year cycle. Changes to the scheduled use require prior approval.
2. Turnout is subject to Boise District range readiness criteria.
3. Your completed actual use report is due within 15 days of completing your authorized annual grazing use.
4. Salt and/or supplements shall not be placed within one quarter (1/4) mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. Trailing activities must be coordinated with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permits in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
8. All appropriate documentation regarding base property leases, lands offered for exchange-of-use, and livestock control agreements must be approved prior to turn out. Leases of land and/or livestock must be notarized prior to submission and be in compliance with Boise District Policy.
9. Failure to pay the grazing bill within 15 days of the due date specified shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, not to exceed $250.00. Payment made later than 15 days after the due date shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR § 4140.1(b)(1) and shall result in action by the authorized officer under 43 CFR § 4150.1 and § 4160.1.
10. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
11. Livestock grazing will be in accordance with your allotment grazing schematic(s). Changes in scheduled pasture use dates will require prior authorization.
12. Utilization may not exceed 50 percent of the current year's growth.

2.8.2.5 Alternative 5 – Garat Allotment

Under Alternative 5, no grazing would be authorized on public lands within the Garat allotment for a term of 10 years. The application for grazing permit renewal would be denied and no grazing permit would be offered. All 33,646 AUMs of permitted use in the Garat allotment (19,500 AUMs active use; 3,250 AUMs of voluntary nonuse; 10,896 AUMs suspension) would be cancelled and unavailable for livestock grazing on public lands. Upon expiration of the 10-year term, livestock grazing on the allotment would be reevaluated, with retention of preference (priority for grazing authorization) for approval of application for a grazing permit attached to current base property.

2.8.3 Swisher Springs (0450) and Swisher FFR (0637) Allotments

2.8.3.1 Alternative 1 – Swisher Springs and Swisher FFR Allotments

Under Alternative 1, BLM would renew the permit to graze livestock within the Swisher Springs and Swisher FFR allotments with the same terms and conditions as those in the replaced permit, except for authorized livestock numbers and AUMs of active use in the Swisher Springs allotment. Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would continue to be terms and conditions of the offered permits. The average actual use reported during the past 10 years (2002 to 2011) for the Swisher Springs allotment has been 285 AUMs, with a maximum of 322 AUMs reported in 2011. Alternative 1 authorizes grazing in the Swisher Springs allotment at levels equivalent to the maximum actual use reported since 2002 (Appendix B). In addition, Alternative 1 would authorize grazing in the Swisher FFR allotment consistent with the replaced permit. The Swisher FFR allotment includes a large acreage of private land and would continue to be managed custodially. Livestock numbers and dates may vary annually with the established period of use for Swisher FFR allotment determined by the permittee, provided AUMs are not exceeded and unacceptable impacts to public land resources do not occur.

The 06 Livestock Co. would be offered a 10-year grazing permit with active use as defined in Table ALT-31. The alternative includes the elimination of 23 active use AUMs of grazing from permitted use in the Swisher Springs allotment.

Table ALT-31: Permitted grazing use within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 1 – Current Situation

Permittee	Allotment	Active Use	Suspension	Permitted Use
06 Livestock Co.	Swisher Springs	322	192	514
06 Livestock Co.	Swisher FFR	15	0	15

The 2-year pasture rotation schedule implemented since 1982 and identified in Table ALT-32 would continue to be a term and condition of the permit. Flexibility in the established grazing schedule to adjust grazing annually due to climatic conditions and other factors, as identified in the terms and conditions of the permit and as implemented during the 10-year period between 2001 and 2010, would continue to be implemented (See Appendix B for a summary of actual use reported for the Swisher Springs allotment).

Table ALT-32: Swisher Springs allotment grazing schedule with implementation of Alternative 1 - Current Situation

Pasture	Year 1	Year 2
Pasture 1	4/15 to 7/15	Rest
Pasture 2	7/16 to 10/31	7/16 to 10/31
Pasture 3	Rest	4/15 to 7/15

Mandatory and other terms and conditions of the offered permits would be defined as listed in Table ALT-33.

Table ALT-33: Mandatory and other terms and conditions of the permit offered to the 06 Livestock Co. to graze livestock within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 1 – Current Situation

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00450 Swisher Springs	49	Cattle	4/15	10/31	100	Active	322
00637 Swisher FFR	15	Cattle	12/1	12/31	100	Active	15

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions

1. Grazing use in the Swisher Springs allotment will be in accordance with the grazing schedule identified in the 1989 decision and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Changes to the scheduled use require approval.
2. Livestock numbers and dates may vary annually within your established period of use for Swisher FFR Allotment, provided AUMs are not exceeded.
3. Turn-out is subject to the Boise District range readiness criteria.
4. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. You are required to coordinate trailing activities with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. You are required to maintain rangeland improvements in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within designated Wilderness requires prior consultation with the authorized officer.
8. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5) for each allotment. The completed form(s) must be submitted to this office within 15 days from the last day of your authorized annual grazing use.
9. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4) mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development.
10. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.

2.8.3.2 Alternative 2 – Swisher Springs and Swisher FFR Allotments

BLM received an application for grazing permit renewal for use in Swisher Springs and Swisher FFR allotments dated June 27, 2011. The application did not request changes to terms and conditions of the current permit. Under alternative 2, BLM would renew the grazing permit with no changes to terms and conditions. Terms and conditions for stubble height, woody browse, utilization, and stream bank alteration imposed on the grazing permit by the United States District Court for the District of Idaho would continue to be terms and conditions of the offered permits. The complete application is reproduced in Appendix G.

The 06 Livestock Co. would be offered a 10-year grazing permit with an active use of 345 AUMs in the Swisher Springs allotment and 15 AUMs in the Swisher FFR allotment as outlined in Table ALT-34. The alternative includes 23 more AUMs of grazing use in the Swisher Springs allotment as compared to the Current Situation alternative, although the same number of AUMs as the current permit. The alternative includes no change in the AUMs of use in the Swisher FFR allotment as compared to the Current Situation alternative or the current permit.

Table ALT-34: Permitted grazing use within Swisher Springs and Swisher FFR allotments with implementation of Alternative 2 – Applicant's Proposed Action

Permittee	Allotment	Active Use	Suspension	Permitted Use
06 Livestock Co.	Swisher Springs	345	192	537
06 Livestock Co.	Swisher FFR	15	0	15

The 2-year pasture rotation schedule implemented since 1982 and identified in Table ALT-35 would continue to be a term and condition of the permit. The Swisher FFR allotment includes a large acreage of private land and would continue to be managed custodially. Livestock numbers and dates may vary annually with the established period of use for Swisher FFR allotment determined by the permittee, provided AUMs are not exceeded and unacceptable impacts to public land resources do not occur.

Table ALT-35: Swisher Springs allotment grazing schedule with implementation of Alternative 2 – Applicant's Proposed Action

Pasture	Year 1	Year 2
Pasture 1	4/15 to 7/15	Rest
Pasture 2	7/15 to 10/31	7/15 to 10/31
Pasture 3	Rest	4/15 to 7/15

Mandatory and other terms and conditions of the offered permits for grazing use in the Swisher Springs and Swisher FFR allotments would be defined as listed in Table ALT-36.

Table ALT-36: Mandatory and other terms and conditions of the offered permit for the 06 Livestock Co., to graze livestock within the Swisher Springs and Swisher FFR allotments with implementation of the Alternative 2 – Applicant's Proposed Action

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00450 Swisher Springs	53	Cattle	4/15	10/31	100	Active	348
00637 Swisher FFR	15	Cattle	12/1	12/31	100	Active	15

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Livestock numbers and dates may vary annually within your established period of use provided AUMs are not exceeded.
2. Turn-out is subject to the Boise District range readiness criteria.
3. Salt and/or supplement shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
4. Changes to the scheduled use require approval.
5. You are required to coordinate trailing activities with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. You are required to maintain rangeland improvements in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee. All maintenance of range improvements within a wilderness study area requires prior consultation with the authorized officer.
8. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5) for each allotment. The completed form(s) must be submitted to this office within 15 days from the last day of your authorized annual grazing use.
9. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4)-mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development.
10. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.

United States District Court for the District of Idaho imposed terms and conditions

11. Key herbaceous riparian vegetation, where stream bank stability is dependent upon it, will have a minimum stubble height of 4 inches on the stream bank, along the greenline, after the growing season;
12. More than 50 percent of the current annual twig growth for key riparian browse vegetation that is within reach of the animals will not be used;
13. Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed (sic) more than 50 percent during the growing season, or 60 percent during the dormant season; and
14. Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

2.8.3.3 Alternative 3 – Swisher Springs and Swisher FFR Allotments

Under Alternative 3, terms and conditions of grazing permits would identify intensities of livestock use that would be used to limit adverse impacts from livestock grazing on resource values. BLM would renew the permit to graze livestock within Swisher Springs and Swisher FFR allotments with the same terms and conditions for livestock numbers, scheduled beginning and end dates for use of the allotment, pasture rotations, pasture seasons of use, and active use AUMs, as those in the replaced permit for the Swisher Springs allotment. However, in order to meet rangeland health standards and ORMP management objectives on the Swisher Springs allotment, performance based terms and conditions would be added to the permits (see terms and conditions 11-13 below and Table Alt-1 in Section 2.3). The performance-based terms and conditions would limit utilization during the active growing season for upland perennial bunchgrasses, require mandatory stubble heights in riparian areas, place hard limits on streambank alteration and woody browse use, and impose perennial herbaceous vegetation height requirements for uplands in important sage-grouse habitat. Upon failure to meet any one performance-based term and condition in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management .

The Swisher FFR allotment includes a large acreage of private land and would continue to be managed custodially. The performance-based terms and conditions would not apply to grazing use in the Swisher FFR allotment. Livestock numbers and dates may vary annually within the established period of use for the Swisher FFR allotment, provided AUMs are not exceeded and unacceptable impacts to public land resources do not occur. The 06 Livestock Co. would be offered a 10-year grazing permit with active use unchanged and as defined in Table ALT-37.

Table ALT-37: Permitted grazing use within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 3 – Performance-based

Permittee	Allotment	Active Use	Suspension	Permitted Use
06 Livestock Co.	Swisher Springs	345	192	537
06 Livestock Co.	Swisher FFR	15	0	15

The 2-year pasture rotation schedule implemented since 1982 and identified in Table ALT-38 would continue to be a term and condition of the permit.

Table ALT-38: Swisher Springs allotment grazing schedule with implementation of Alternative 3 – Performance-based

Pasture	Year 1	Year 2
Pasture 1	4/15 to 7/15	Rest
Pasture 2	7/16 to 10/31	7/16 to 10/31
Pasture 3	Rest	4/15 to 7/15

Mandatory and other terms and conditions of the offered permits to graze livestock in the Swisher Springs and Swisher FFR allotments would be defined as listed in Table ALT-39.

Table ALT-39: Mandatory and other terms and conditions of the permit offered to the 06 Livestock Co. to graze livestock within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 3 – Performance-based

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	**Kind**	**Begin**	**End**			
00450 Swisher Springs	52	Cattle	4/15	10/31	100	Active	342
00637 Swisher FFR	15	Cattle	12/1	12/31	100	Active	15

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use in the Swisher Springs allotment will be in accordance with the grazing schedule identified in the 1989 grazing decision and restated in the final decision of the Owyhee Field Office Manager dated ________________________. Flexibility is provided to allow seven days to complete moves between pastures. Changes to the scheduled use require approval.
2. Livestock numbers and dates may vary annually within your established period of use for Swisher FFR Allotment, provided AUMs are not exceeded.
3. Turn-out is subject to the Boise District range readiness criteria.
4. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. You are required to coordinate trailing activities with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
6. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
7. You are required to maintain rangeland improvements in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee.
8. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5) for each allotment. The completed form(s) must be submitted to this office within 15 days from the last day of your authorized annual grazing use.
9. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4) mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development.
10. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
11. **Performance-based terms and conditions:** Grazing permit terms and conditions 12 through 14 are performance-based terms and conditions which require the permittee to implement livestock management practices to limit impacts to resource attributes. These terms and conditions are included in this permit to meet the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and ORMP objectives. Upon failure to meet any one performance-based term and condition in the allotment in 2 years of any consecutive 5-year period, the livestock grazing permit would be temporarily suspended, modified, and reoffered with appropriate terms and conditions to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.
12. Seasonal utilization within pastures scheduled for grazing use between May 1 and July 1 may not exceed the slight category (≤ 20 percent) (Key Species Method).
13. Riparian stubble height of hydric species may not be equal to or less than 6 inches within lotic and lentic riparian areas at the end of the grazing season. Woody browse utilization may not be greater than 30 percent within lotic and lentic riparian areas at the end of the grazing season. Stream bank alternation within lotic riparian areas may not be greater than 10 percent at the end of scheduled livestock grazing. Edge shear within lentic riparian areas may not be greater than 20 percent at the end of scheduled livestock grazing.
14. Native perennial herbaceous vegetation height may not be less than 7 inches post-grazing within PPH-sagebrush in pastures 1 and 3 when grazing use is scheduled between March 15 and June 15 or less than 4 inches post grazing within PPH-sagebrush in these pastures when grazing use is scheduled at times other than between March 15 and June 15.

2.8.3.4 Alternative 4 – Swisher Springs and Swisher FFR Allotments

Under Alternative 4, seasons of grazing use would be used to limit adverse impacts from livestock grazing on resource values. BLM developed Alternative 4 – Season-based with constraints on periods when grazing would be authorized specific to sage-grouse habitats, upland perennial vegetation communities, or riparian resources present within each pasture. In order to meet rangeland health standards and ORMP management objectives on the allotment, these constraints would be used to define a grazing rotation for the Swisher Springs allotment that would address issues identified in the evaluation report for the Swisher Springs and Swisher FFR allotments by defining seasons of grazing use appropriate to maintaining or improving specific resource values (USDI BLM, 2012c). The grazing permit would limit livestock management practices in the Swisher Springs allotment to provide opportunity for recovery of sagebrush steppe bunchgrass species following active growing season[21] grazing use, breeding habitat for sage-grouse (pre-laying, nesting and early brood-rearing), lentic and lotic riparian function, and soil protection to support hydrologic function and soil/site stability. Criteria used to develop the grazing schedule for the Swisher Springs allotment are provided in Table ALT-40.

Table ALT-40: Resource based constraints used to develop the Season-based grazing schedule for the Swisher Springs allotment

Resource Constraints	Pasture 1	Pasture 2	Pasture 3
Sage Grouse/Wildlife	Grazing use no more than 1 in 3 years during the sage-grouse breeding season (April 15 through June 15)		
Vegetation and Soils	Grazing use no more than 1 in 3 years during the active growing season for upland bunchgrass species (May 1 through July 1)		
Riparian		No use mid-summer (July 1 through September 30)	

Livestock grazing in the Swisher Springs allotment during the active growing season (May 1 through July 1) for native perennial bunchgrass species would be limited to no more than 1 in each 3 consecutive years to improve and maintain the health of native perennial herbaceous species, as well as to provide vegetative cover and litter deposition for soil protection. All pastures provide PPH-sagebrush for sage-grouse and therefore livestock grazing would be limited to no more than 1 in any 3 consecutive years during the breeding season (April 15 through June 15). Seasons of livestock grazing use within riparian areas would be limited to allow recovery of non-functioning or functioning-at-risk riparian areas and maintenance of riparian areas in proper functioning condition, by excluding livestock grazing from the pasture 2 between July 1 and September 30 in all years.

Under the season-based alternative, BLM would set the stocking rate for the Swisher Springs allotment at 10 acres per AUM within the pasture most limited by the number of cattle and duration of scheduled use[22]

[21] The active growing season for bluebunch wheatgrass, Idaho fescue, and other native perennial bunchgrass species within vegetation communities of Swisher Springs and Swisher FFR allotments is May 1 to July 1, a period when decreasing soil moisture does not provide opportunity for new tiller formation and regrowth before the dormant period.

[22] If BLM were to implement actions to maximize livestock use of forage production, approximately 4.7 acres would be required to support one AUM in the Swisher Springs allotment in a normal year, assuming ideal conditions with forage production from all ecological sites at potential, equal livestock distribution throughout the allotment, and utilization at 50 percent of grass and grass-like species. These ideal conditions are not present within the Swisher Springs allotment. Vegetation inventories identify most sites within the allotment in an ecological status less than potential natural condition. Equal

(see Appendix D). Ten acres per AUM is consistent with current stocking rates that were identified as not a cause for failure to meet rangeland health standards or management objective (USDI BLM, 2012c). Additionally, the 10 acres per AUM stocking rate is a conservative stocking rate consistent with ecological site potential within the allotment, as limited by inventoried condition, water availability, and topography[23].

The 06 Livestock Co. would be offered a 10-year grazing permit with an active use of 210 AUMs in the Swisher Springs allotment and for 15 AUMs in the Swisher FFR allotment as outlined in Table ALT-41. As a result of the constraint in periods when pastures with sage-grouse habitats, upland perennial vegetation communities, or riparian resources would be available for grazing use, the alternative includes the elimination of 135 active use AUMs from permitted use in the Swisher Springs allotment.

The Swisher FFR allotment includes a large acreage of private land and would continue to be managed custodially. The season-based constraints would not apply to grazing use in the Swisher FFR allotment. Livestock numbers and dates may vary annually within the grazing year (March 1 through February 28), provided AUMs are not exceeded and unacceptable impacts to public land resources are not identified. The alternative includes the elimination of 122 active use AUMs.

Table ALT-41: Permitted grazing use within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 4 – Season-based

Permittee	Allotment	Active Use	Suspension	Permitted Use
06 Livestock Co.	Swisher Springs	210	192	402
06 Livestock Co.	Swisher FFR	15	0	15

The grazing schedule identified in Table ALT-42 would be established for pastures in the Swisher Springs allotment and made a term and condition of the grazing permit. The schedule would implement the pasture constraints identified above in Table ALT-39. Flexibility would be provided to allow 7 days to complete moves between pastures, so long as cattle grazing in pastures containing identified riparian resources does not occur between July 1 and September 30. Similarly, flexibility is provided in the move date between pastures, so long as deferment of grazing outside the active growing season for native perennial bunchgrasses is provided in at least 1 of each 3-year period. The integrity of pastures as a grazing unit would be maintained during the scheduled concurrent period of use of pastures 1 and 3 in year 3.

Table ALT-42: Swisher Springs allotment grazing schedule with implementation of Alternative 4 – Season-based

Pasture	Year 1	Year 2	Year 3
Pasture 1	7/14 to 10/31	4/15 to 8/2	7/1 to 10/31
Pasture 2	Rest	Rest	4/15 to 6/30
Pasture 3	4/15 to 7/13	8/3 to 10/31	7/1 to 10/31

distribution of livestock is limited by topography, distance from water, and other natural factors that do not allow an even 50 percent utilization in all portions of each pasture. In addition, measured utilization includes vegetation removed by native herbivores, including insects. Finally, management objectives to sustain resource values in addition to forage production often do not allow opportunity to maximize use of forage produced for livestock production. With current management, pasture 1 is scheduled to have the greatest number of acres (8.7 acres) to support 1 AUM during all years of the pasture rotations, and pasture 3 is scheduled to have the least number of acres (6.2 acres) in all years.

[23] See analysis of Alternative 1, Rangeland Vegetation for the Swisher Springs allotment

Mandatory terms and conditions of the offered permits for grazing use in the Swisher Springs and Swisher FFR allotments would be defined as listed in Table ALT-43.

Table ALT-43: Mandatory and other terms and conditions of the permit offered to the 06 Livestock Co. to graze livestock within the Swisher Springs and Swisher FFR allotments with implementation of Alternative 4 – Season-based

Allotment	Livestock		Grazing Period		% PL	Type Use	AUMs [1]
	Number	Kind	Begin	End			
00450 Swisher Springs	32	Cattle	4/15	10/31	100	Active	210
00637 Swisher FFR	15	Cattle	12/1	12/31	100	Active	15

[1] The sum of the AUMs from the Authorization Schedule Information may not equal the Active use AUMs for each authorization or allotment due to rounding in the AUM calculation.

Terms and conditions:

1. Grazing use in the Swisher Springs allotment will be in accordance the final decision of the Owyhee Field Office Manager dated _______________________. Changes to the scheduled use require approval. Flexibility is provided to allow seven days to complete moves between pastures, so long as cattle grazing in pastures containing identified riparian resources does not occur between July 1 and September 15.
2. Livestock numbers and dates may vary annually within your established period of use for Swisher FFR allotment, provided AUMs are not exceeded.
3. Turn-out is subject to the Boise District range readiness criteria.
4. Salt and/or supplements shall not be placed within one-quarter (1/4)-mile of springs, streams, meadows, aspen stands, playas, or water developments.
5. Changes.
6. You are required to coordinate trailing activities with the BLM prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
7. Livestock exclosures located within your grazing allotment are closed to all domestic grazing use.
8. You are required to maintain rangeland improvements in accordance with the cooperative agreement and range improvement permit in which you are a signatory or assignee.
9. You are required to properly complete, sign and date an Actual Grazing Use Report Form (4130-5) for each allotment. The completed form(s) must be submitted to this office within 15 days from the last day of your authorized annual grazing use.
10. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4) mile away from any riparian area, spring, stream, meadow, aspen stand, playa, special status plant population, or water development.
11. Pursuant to 43 CFR § 10.4(b), you must notify the BLM Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR § 10.2) on federal lands. Pursuant to 43 CFR § 10.4(c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.

2.8.3.5 Alternative 5 – Swisher Springs and Swisher FFR Allotments

Under Alternative 5, no grazing would be authorized on public lands within the Swisher Springs or Swisher FRR allotments for a term of 10 years. The application for grazing permit renewal would be denied and no grazing permit would be offered. All 537 AUMs of permitted use in the Swisher Springs allotment (345 AUMs active use; 192 AUMs suspension) and 15 AUMs of permitted use in the Swisher FFR allotment (15 AUMs active use; 0 AUMs suspension) would be cancelled and unavailable for livestock grazing on public lands. Upon expiration of the 10-year term, livestock grazing on the allotment(s) would be reevaluated, with retention of preference (priority for grazing authorization) for approval of application(s) for grazing permit(s) attached to current base property(s).

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter of the EA presents relevant information about the existing environment that will be analyzed for each alternative, followed by analysis of the impacts of each alternative on each resource.

3.1 Resources Considered in the Impact Analysis

Resource	Not Present	Present Not Impacted	Present Impacted	Impacts
Mineral Resources	X			
Soil Resources			X	
Paleontological Resources	X			
Floodplains	X			
Vegetation			X	
Forest Resources	X			
Wetland and Riparian Zones			X	
Invasive, Non-Native Species			X	
Threatened, Endangered, and Sensitive Plants			X	
Air Quality	X			
Water Quality (Surface and Ground)			X	
Fisheries			X	
Threatened, Endangered, and Sensitive Fish			X	Davis' peppergrass: Trailing and congregation of livestock in playas during Spring and winter seasons when soils and plants are vulnerable.
Wildlife Resources			X	
Threatened, Endangered, and Sensitive Animals				
Migratory Birds			X	
Range Resources			X	
Economic and Social Values			X	

Resource	Not Present	Present Not Impacted	Present Impacted	Impacts
Existing and Potential Land Uses		X		
Access	X			
Prime and Unique Farmlands	X			
Wastes, Hazardous and Solid	X			
Environmental Justice	X			
Cultural Resource			X	
Tribal Treaty Rights and Interests		X		
Native American Religious Concerns		X		
Recreational Use			X	
Visual Resources		X		
Areas of Critical Environmental Concern (ACEC)			X	
Wilderness/WSA			X	
Wild and Scenic Rivers		X		
Wild Horse and Burro HMAs	X			

3.2 Resources Excluded from Analysis

No wild horse and burro management areas are located within any portion of the four Owyhee River allotments, so impacts to wild horse management or herd management areas will not be addressed in this EA.

3.3 All Allotments

3.3.1 Common to All Allotments: Affected Environment and Direct/Indirect Effects

3.3.1.1 Rangeland Vegetation, Including Noxious Weeds and Invasive Plants

Vegetation Inventory

The ecological site inventory has been the Bureau of Land Management standard vegetation inventory since 1982. An ecological site is a land structure type with physical characteristics that sets it apart from other sites in its ability to produce a distinctive kind and amount of vegetation. It is the product of all the environmental factors responsible for its development, and it has a set of key characteristics (soils, hydrology, and vegetation) that are included in the ecological site description. Ecological sites are correlated with and can generally be determined directly from a soils map.

The vegetation types and ecological sites for public lands within Owyhee Field Office were described in a vegetation inventory and analysis using methodologies described in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980) and the Bruneau-Kuna Grazing Environmental Impact Statement Draft (USDI BLM, 1982). Vegetation inventories for public lands in Owyhee County were correlated to soil surveys and reported in the Soil Survey of Owyhee County, Idaho[24] (USDA NRCS, 2003b).

The potential natural vegetation communities for ecological sites represented in the Owyhee River Group allotments are primarily dominated by sagebrush/bunchgrass in a range of site descriptions, with soil depths from very shallow to moderately deep and textures from loamy to clay. Some sites have significant surface stones. Potential vegetation communities developed with an effective average annual precipitation as little as 8 inches for some sites to more than 16 inches for other sites (USDA NRCS, 2010). In addition to ecological sites dominated by sagebrush/bunchgrass, mountain shrub-dominated communities described in the Mahogany Savanna ecological site description, with an average annual precipitation of 16 to 22 inches, occur on Juniper Mountain in the Castlehead-Lambert allotment.

Although ecological site descriptions for the Owyhee River Group allotments indicate that vegetation communities are dominated by sagebrush/bunchgrass communities under a natural disturbance regime, unmapped inclusions are present within the larger ecological sites. Examples of unmapped inclusions are stands of juniper or aspen, riparian areas, and areas with the surface features devoid of vegetation. Allotment-specific information for each of the Owyhee River Group allotments identifying ecological sites, dominant vegetation, and acreages are provided in the vegetation Affected Environment sections of this EA.

Weeds

In Idaho, the BLM works closely with the Idaho Department of Agriculture, Tribal governments, and county governments to combat noxious weeds. Cooperative weed management arrangements utilize local, state and Federal resources to inventory and treat weed infestations on both public and private lands. Populations are inventoried, recorded, treated, monitored, and retreated as their presence is known. Undiscovered noxious weeds may also exist. The effectiveness of weed control is monitored using site-specific and landscape level methods:

- Site-specific weed monitoring involves assessing the effectiveness of the treatment or control method on specific weed species relative to application rate, method, and treatment area. Monitoring methods may be qualitative or quantitative and are commensurate with the level of treatment complexity, size, and extent of infestation. The methods used to monitor treated areas may include field observations, photo plots, and/or density plot methods. Management actions may be refined or changed over time as these data are analyzed.
- Landscape level weed monitoring is accomplished over the long term by tracking weed occurrences through Geographic Information System (GIS) mapping. Weed sites are inventoried and mapped to monitor their extent and rate of spread.

Climate Change

Changes in greenhouse gas levels affect global climate. Ring et al. (2012) reviewed scientific information on greenhouse gas emissions and climate change, including the four Assessment Reports of the

[24] Vegetation inventories for public lands in Owyhee Field Office were completed between 1977 and 1979 using the Soil Vegetation Inventory Method and Range Site Descriptions. These techniques were the precursor of the current Ecological Site Inventory methods.

Intergovernmental Panel on Climate Change between 1990 and 2007, and recognized a growing consensus within the scientific community that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations. While the additional analysis by Ring et al. (2012) included data through 2010 and supports the earlier conclusions by others, the level of skepticism regarding global warming among the general public, at least in the United States, remains much higher.

A number of researchers, including Lapage et al. (2012) while recognizing the inherent variability within and appropriate application of global and regional climate models, have recognized the potential impact to agricultural production that climate change scenarios, including altered temperature and precipitation regimes at the regional level may induce. Neilson et al. (2005) in summarizing output from seven models and possible scenarios of regional climate change in the Great Basin identified long-term trends toward greater precipitation and warmer temperatures, although noted inter-annual and inter-decadal variability that could account for short-term records that may differ. A similar summary of the available studies and models is presented by Chambers and Pellant (2008).

Possible consequences to vegetation communities resulting from climate change in the Great Basin include a dramatic increase and expansion of woody frost-sensitive species at the expense of shrubland and a corresponding increase in fire. Bradley (2009) modeled the consequences that altered summer precipitation and winter temperature could have on the potential risk of cheatgrass expansion or contraction, noting that climatic change will affect the potential geographic distribution of cheatgrass and will likely affect other plant invaders as well. Ash et al. (2012) identified that adaptation options will be required in different rangeland regions in response to climate change to enhance the development of sustainable livelihoods with both social and ecological resilience. Technical input to the 2013 National Climate Assessment identified the process of adjustment to actual and expected climate and its effects in order to moderate harm or exploit beneficial opportunities on biodiversity, ecosystems, and ecosystem services (Staudinger, et al., 2012). Beschta et al. (2012) recommended strategies for western public lands to reduce anthropogenic stressors of terrestrial and aquatic ecosystems which may add to stressors from climate change, primarily reduction or elimination of ungulate use to help native species and ecosystems survive in an altered environment.

With consideration for anticipated stressors induced by climate change, appropriate livestock management practices that improve and maintain healthy and functioning vegetation communities which provide for proper nutrient cycling, hydrologic cycling, and energy flow remains the primary adaptation against changing precipitation and temperature regimes.

Cumulative effects

Though the CIAA for vegetation on all of the Group 1 allotments was set at the allotment boundary (see above), BLM also considered cumulative effects to vegetation at the project level given that this document ultimately considers permit renewals for four allotments. Accordingly, for the purposes of this paragraph, BLM set the CIAA to the entire project area (including the entirety of the Garat, Castlehead-Lambert, Swisher Springs, and Swisher FFR Allotments) and considered the potential additive effects of Alternatives 1-5 for the Castlehead-Lambert Allotment to all of the past, present, and reasonably foreseeable future actions affecting vegetation on all of the allotments. This exercise showed that while

BLM expects to see vegetation improvement across all allotments because of direct and indirect effects of grazing management changes, BLM does not expect to see a measurable cumulative effect to vegetation, and certainly no effect that approaches significance.

3.3.1.2 Soils

See Appendix M

Cumulative effects

Though the CIAA for soils on all of the Group 1 allotments was set at the allotment boundary (see above), BLM also considered cumulative effects to soils at the project level given that this document ultimately considers permit renewals for four allotments. Accordingly, for the purposes of this paragraph, BLM set the CIAA to the entire project area (including the entirety of the Garat, Castlehead-Lambert, Swisher Springs, and Swisher FFR Allotments) and considered the potential additive effects of Alternatives 1-5 for the Castlehead-Lambert Allotment to all of the past, present, and reasonably foreseeable future actions affecting soils on all of the allotments. This exercise showed that while BLM expects to see soils improvement across all allotments because of direct and indirect effects of grazing management changes, BLM does not expect to see a measurable cumulative effect to soils, and certainly no effect that approaches significance.

3.3.1.3 Special Status Plant Species

A review of the Group 1 sensitive plant species and potential habitat was completed using existing district data, communicating with BLM personnel, and preparing the biological assessments/evaluations for the RHA. Botanical surveys have been conducted across various portions of the Group 1 allotments to collect information related to plant communities, habitat assessments, and locations of target plant species (i.e., sensitive species, State-listed species, and species of local concern). Soil mapping data, aerial photographs, and topographic maps were all used to identify potential habitat and survey areas.

Livestock grazing can result in changes in habitat quality for plants, and these changes can be both beneficial and adverse, depending on the proximity of grazing to occupied habitat, season of use, duration of grazing, sensitivity of species involved, and habitat type affected. Impacts to target plant species may be direct (e.g., trailing or grazing) or indirect (e.g., a change in the microclimate or a non-native infestation due to disturbance), resulting in a loss of habitat. Livestock grazing impacts the habitat by disturbing soil interspaces, which results in soil erosion, compaction, and loss of biological soil crust and can lead to increased competition of non-native species with native species. Reproductive capabilities of perennial plants that have been grazed show reduced vigor, along with reduced seedhead production of perennial bunchgrasses. Reduction of plant vigor, growth and seed production intensifies the shift toward undesirable plant habitat, creating a loss of sustainable native habitats with decreased biodiversity of forage for wildlife (including sage-grouse and pollinators) and cattle. Additionally, decreases in biodiversity, in conjunction with introduction of non-native species such as cheatgrass, lead to proliferations of fine fuels with potential increases of fire intervals. Loss of diversity generally causes ecosystem instability and, in portions of the Intermountain West, increases fire frequencies (Whisenant, 1989). Further impacts of decreased biodiversity result in reduced recreation opportunities (i.e., hunting, camping, and fishing) and economic profit (i.e., mineral development, livestock grazing, and seed harvesting).

3.3.1.4 Water Resources and Riparian-Wetland Areas

Direct and Indirect Effects - Introductory Information

The term *riparian* denotes a landscape position rather than a specific type of ecosystem; riparian areas are located next to a body of water or wetland. Riparian areas are widely recognized as the most biologically diverse and productive of all ecosystems (Kauffman, Krueger, & Vavra, 1984) (Powell, Cameron, & Newman, 2000). Riparian areas filter sediment, stabilize soil and stream banks, regulate water temperature and flow, and provide many significant habitat attributes for terrestrial and aquatic wildlife (Stevens, McArthur, & Davis, 1992). Because riparian areas generally offer gentle slopes, cool microclimate, available water, and abundant forage, livestock often concentrate there (Powell, Cameron, & Newman, 2000).

The riparian areas that occur within the allotments have both structural and functional diversity; thus, there is a need to characterize and quantify the effects of grazing management practices on the stream and spring riparian communities and the maintenance of hydrologic systems. The impacts discussed below under each alternative focus primarily on differences among season of use because there is no conclusive evidence and information is speculative regarding impacts on riparian-wetland areas from livestock numbers (Powell, Cameron, & Newman, 2000).

The streams and springs that occur within the allotments are unique in their particular setting: stream characteristics, valley bottom type and soils, potential vegetation, relationship to upland topography and vegetation. Therefore, each area will require a unique strategy to accomplish desired conditions and meet objectives. There are no one-size-fits-all prescriptions for livestock grazing in riparian areas; however, authors agree that any successful grazing strategy will at a minimum:

- Limit grazing intensity and season of use to provide sufficient rest to encourage plant vigor, regrowth, and energy storage;
- Ensure sufficient vegetation during period of high flow to protect stream banks, dissipate energy, and trap sediments; and
- Control the timing of grazing to prevent damage to stream banks when they are most vulnerable to trampling.

Table RIPN-1: General relationship between grazing scheme, stream system characteristics, and riparian vegetation response (*Adapted from* (Elmore W. , 1994))

Alternative	**Grazing System**	**Steep Low Sediment Load**		**Steep High Sediment Load**		**Moderate Low Sediment Load**		**Moderate High Sediment Load**		**Flat Low Sediment Load**		**Flat High Sediment Load**	
1, 2, and 3	Rest Rotation	Shrubs Herbs Banks	D I 0; D	Shrubs Herbs Banks	D I 0; D	Shrubs Herbs Banks	D I 0; I	Shrubs Herbs Banks	D I I	Shrubs Herbs Banks	D I I	Shrubs Herbs Banks	D I I
1, 2, and 3	Season-Long	Shrubs Herbs Banks	D D 0; D	Shrubs Herbs Banks	D D 0; D	Shrubs Herbs Banks	D D D	Shrubs Herbs Banks	D D D	Shrubs Herbs Banks	D D D	Shrubs Herbs Banks	D D D
1, 2, and 3	Spring and Summer	Shrubs Herbs Banks	D D 0; D	Shrubs Herbs Banks	D D 0; D	Shrubs Herbs Banks	D D D	Shrubs Herbs Banks	D D D; 0	Shrubs Herbs Banks	D D D; 0	Shrubs Herbs Banks	D D 0; I
4	Deferred Rotation	Shrubs Herbs Banks	D I 0; D	Shrubs Herbs Banks	D I 0; D	Shrubs Herbs Banks	D I 0; +	Shrubs Herbs Banks	D I I	Shrubs Herbs Banks	D I I	Shrubs Herbs Banks	D I I
5	No Grazing	Shrubs Herbs Banks	I I 0	Shrubs Herbs Banks	I I 0; I	Shrubs Herbs Banks	I I 0	Shrubs Herbs Banks	I I I	Shrubs Herbs Banks	I I I	Shrubs Herbs Banks	I I I

Note: D = decrease; I = increase; 0 = no change. Stream Gradient: 0 to 2% = flat; 2 to 4% = moderate; > 4% = steep.

Table RIPN-2: Effects of livestock grazing on aquatic and riparian habitats by alternative and season of use (*Adapted from* (Bellows, 2003) *and* (Belsky, Matzke, & Uselman, 1999))

Alternative(s)[25]	**Season of Use**	**Issues & Impacts**	
1, 2, 3, and 4	Spring (March-June)	▪ Soil compaction	• Increased erosion • Sediment loading of riparian areas and streams • increased flooding • reduced groundwater recharge • lowered after table • increase stream bank erosion • removal of submerged vegetation • reduced aquatic habitat • reduced fish spawning habitat
		▪ Selective grazing on palatable	○ Decreased herbaceous cover ○ Decreased species and age diversity

[25] The alternatives listed contain some component of the season of use within the riparian pastures (1, 2, 5, & 6) (i.e., Alternative 1 would allow grazing during spring, summer, and fall)

Alternative(s)[25]	Season of Use	Issues & Impacts	
		species	• less shade and higher stream temperatures • decrease in stream bank stability • less sediment trapping • decreased water infiltration impaired aquatic and fish habitat
1, 2, and 3	Summer (July-Sept.)	• Browsing on trees and shrubs	○ Decreased tree and shrub cover • decline in stream bank stability • less shade and higher stream temperatures • loss of wildlife habitat • impaired fish habitat
1, 2, and 3	Season Long (March-Sept.)	▪ Browsing on trees and shrubs ▪ Continuous grazing	• Decreased tree and shrub cover • decline in stream bank stability • less shade and higher stream temperatures • loss of wildlife habitat • impaired fish habitat ○ Decreased species and age diversity ○ Decreased herbaceous cover • less shade and higher stream temperatures • decrease in stream bank stability • less sediment trapping • decreased water infiltration • impaired aquatic and fish habitat
1, 2, 3, and 4	Fall (October-Nov.)	• Browsing on trees and shrubs	○ Decreased tree and shrub cover • decline in stream bank stability • less shade and higher stream temperatures • loss of wildlife habitat • impaired fish habitat
1, 2, 3, and 4	All Seasons	▪ Loss of herbaceous vegetation ▪ Loss of stream bank stability	○ Decreased stream bank stability ○ Change in channel shape, structure, and form • Reduced water infiltration • increased runoff • increased water velocity • increased flooding

Alternative(s)[25]	Season of Use	Issues & Impacts	
		▪ Manure deposition in and near streams ▪ In-stream trampling and congregation	• reduced groundwater recharge • lowered water table • increased stream bank erosion • removal of submerged vegetation • reduced aquatic habitat • reduced fish spawning habitat ○ Nutrients, pathogens, and bacteria added to stream ○ Sediment loading of riparian areas and streams • increase water temperature • reduced habitat quality for fish and aquatic species • formation of toxic compounds • human health impacts

3.3.1.5 Wildlife/Wildlife Habitat and Special Status Animal Species

Wildlife Habitat

Three Level IV Ecoregions of Idaho are represented within the Owyhee River Group allotments (Map WDLF-1) (McGrath, et al., 2002). Although these ecoregions are relatively similar, they are distinguished by differences in physiography, precipitation, and elevation. The Dissected High Lava Plateau ecoregion occurs at the lowest elevations and is the flattest, driest, and most extensive of the ecoregions represented. The Owyhee Uplands and Canyons ecoregion occurs on the mid-slope portions of the northern allotments and is characterized by deep canyons, badlands, and rocky outcrops covered with a variety of shrub steppe vegetation communities. The Semiarid Uplands occur on the higher elevation portions of the northern allotments where volcanic mountains and hills ascend out of the lower elevation lava plains; these areas typically are dominated by mountain shrub and woodland communities. In general, the physiognomy of these ecoregions within the allotments is characterized by alluvial fans, rolling shrub steppe uplands, and shrub-dominated lava plains interrupted by low hills, rocky tuffaceous outcrops and precipitous sheer-walled river canyons (McGrath, et al., 2002).

The dominant upland wildlife habitats within the Owyhee River allotments include juniper woodlands, mountain shrublands, sagebrush steppe, native grasslands, and sparsely vegetated rocky outcrops and canyons (Map WDLF-2). Relatively extensive stands of greasewood are found along various intermittent drainages in the Garat allotment. Riparian-wetland wildlife habitats are more limited in abundance and extent and include wet meadow complexes and woody and herbaceous riparian areas along perennial and intermittent streams and around springs, seeps, and reservoirs. Upland and riparian vegetation communities within the Owyhee River allotments are discussed in the Rangeland Vegetation, Water Resources, and Riparian-wetland Affected Environment sections for each allotment.

The expansion of juniper into former shrub communities has transformed most of the Castlehead-Lambert, Swisher Springs, and Swisher FFR allotments into woodlands. These juniper woodlands range from open, savanna-like conditions to dense, nearly closed-canopy forest. In particular, juniper woodlands cover the summit and relatively low-profile flanks of Juniper Mountain (Map WDLF-2); the density of junipers generally increases with elevation.

Recent and historical wildfires have modified wildlife habitats extensively within the Owyhee River allotments (Maps FIRE-1, FIRE-2, FIRE-3). With the exception of pasture 4 (Lambert Table), wildfires in the Castlehead-Lambert and Swisher Springs allotments have reduced juniper cover substantially. Most of these burned areas are recovering naturally and currently consist of native perennial grasslands. Isolated juniper stands and snags that persisted within the burn perimeters currently provide a mosaic of successional habitat types that benefit a diversity of wildlife species. Areas affected by historical wildfires within the Garat allotment have not recovered accordingly and currently are comprised of either exotic annual grasslands (i.e., cheatgrass) or early-seral rabbitbrush communities. These disturbed and altered vegetation communities either do not or only minimally meet the habitat requirements of most wildlife species.

Wildlife Species

Many wildlife species utilize a variety of habitats in the Owyhee River allotments. These habitats provide forage, nesting substrate, and cover for a variety of bird, mammal, amphibian, reptile, and fish species common to southwestern Idaho and the Northern Great Basin region. Although all of the species are important members of native communities and ecosystems, most are common and have wide distributions within the allotments, state, and region. Consequently, the relationship of most of these species to the permit renewal is not discussed here in the same depth as species upon which the BLM places management emphasis.

Although no threatened and endangered species listed under the Endangered Species Act (ESA) occur in the Owyhee River allotments, several candidate species in consideration for listing were identified from the U.S. Fish and Wildlife Service's (USFWS) Endangered Species Program (USDI USFWS, 2011a). BLM, USFWS, and Idaho Department of Fish and Game (IDFG) maintain an active interest in other special status species that have no legal protection under the ESA. BLM special status species are: 1) species listed or proposed for listing under the ESA, and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA (USDI BLM, 2008), which are designated as sensitive by the BLM State Director(s). Special status wildlife species discussed in this document include those listed on the Idaho BLM State Sensitive Species List (USDI BLM, 2003c) and those afforded protection under the Bald and Golden Eagle Protection Act (BGEPA) (USDI USFWS, 1940) with potential to occur within the allotments and whose habitat may be affected by the current action.

One bird and one amphibian species are listed as candidates under the ESA, and 10 mammals, 13 birds, one reptile, two amphibians, and one fish with special status potentially could occur within the Owyhee River allotments and may be affected by the current action. Common and scientific names of special status wildlife species, their status, and occurrence potential within each Owyhee River allotments are summarized in Appendix L.

Focal Special Status Animal Species

With the exception of a few well-studied species, current occurrence and population data for most special status animal species within the Owyhee River allotments are limited due to a deficiency of surveys and directed research. Therefore, only a few focal special status animal species (Lambeck, 1997) will be discussed in detail individually. These species include the greater sage-grouse, Columbia spotted frog, pygmy rabbit, and Columbia River redband trout.

The USFWS has determined that greater sage-grouse and Columbia spotted frogs warrant listing under ESA (i.e., candidate species) but have been precluded due to higher priorities. The Idaho BLM has determined that pygmy rabbit and Columbia River redband trout are imperiled globally and range-wide (i.e., BLM Type 2 sensitive species). These species will be discussed in greater detail because they occur or possibly could occur within the Owyhee River allotments, and they have been the subject of targeted surveys and periodic species-specific monitoring studies.

The focal species concept provides a link between single- and multi-species methods of wildlife conservation and management (Mills, 2007). Focal species serve as a set of species which define the characteristics of different spatial and compositional landscape attributes necessary for functional and healthy ecosystems (Lambeck, 1997) (Caro & O'Doherty, 2001). In short, because they are sagebrush obligates, sage-grouse and pygmy rabbits function as surrogates for sagebrush communities and associated vertebrates (Rowland, Wisdom, Suring, & Meinke, 2006), while spotted frogs and redband trout serve as coarse proxies for the relative integrity of lentic and lotic systems (Reaser, 1996) (Thurow, Lee, & Rieman, 1997). Other special status animal species, migratory birds, raptors, and species of socioeconomic importance (e.g., big game) will be included in a general discussion by taxonomic groupings.

Greater sage-grouse

The greater sage-grouse is a sagebrush-obligate species that requires large areas of relatively undisturbed sagebrush steppe habitat. Sage-grouse were once abundant and concomitant with sagebrush steppe ecosystems across western North America (Schroeder, Young, & Braun, 1999); currently, however, their distribution has been reduced to nearly half of what it was historically (Schroeder, et al., 2004). Despite long-term population declines, sage-grouse persist across more than 250,000 square miles of the sagebrush ecosystem (Schroeder, et al., 2004). Within this requisite sagebrush landscape, important seasonal habitats (e.g., wet meadows, higher elevation mesic shrublands) are also necessary (Connelly, Schroeder, Sands, & Braun, 2000).

Because sage-grouse are still broadly distributed, dependent on a diversity of heterogeneous seasonal habitats, and some populations are wide-ranging, they are expected to be vulnerable to changes to the sagebrush ecosystem. In addition, the maintenance of viable sage-grouse populations is of special concern to state and federal resource managers across the species' present range, and their persistence is important in the socio-political, economic, and environmental realms (Sands & Smurthwaite, 1992). On March 5, 2010, the USFWS submitted a new finding to the Federal Register which found that listing the greater sage-grouse was warranted but precluded by the need to take action on other species facing more immediate and severe extinction threats. The finding has changed the status of sage-grouse from a BLM Type 2 sensitive species to a candidate species under the ESA. Due to these factors, the focal species concept (Mills, 2007) is applicable to sage-grouse because they can serve as an umbrella species for broader conservation of the sagebrush habitats across the West (Rowland, Wisdom, Suring, & Meinke, 2006) (Hanser & Knick, 2011).

The Owyhee River allotments are located in the Western Association of Fish and Wildlife Management Agencies (WAFWA) Snake River Plain Management Zone (MZ; (Stiver, et al., 2006)). The Northern Great Basin population within the Snake River Plain MZ (Garton, et al., 2011) is a large population in Nevada, southeast Oregon, southwest Idaho, and northwest Utah (Map WDLF-3). Of the three subpopulations identified by Connelly et al. (2004) within the Northern Great Basin population, the north-central Central Nevada/southeast Oregon/southwest Idaho (hereafter Owyhee) subpopulation overlaps the Owyhee River allotments (Map WDLF-3).

Generally, habitat conditions have deteriorated or been altered to some degree throughout the entire distribution of sage-grouse. This has caused local extirpations or declines in sage-grouse populations throughout their historical range and in the Owyhee River allotments and surrounding area. Connelly et al., (2004) conducted a population analysis by state but not by management zone, population, or subpopulation; annual rates of change for sage-grouse in Idaho suggest a long-term decline for sage-grouse in Idaho. More recently, Garton et al. (2011) conducted a population analysis of the Northern Great Basin population based on data from 1965 to 2007. During the assessment period, the proportion of active leks decreased and average number of males per active lek declined by 17 percent (Garton, et al., 2011). Although the Garton et al. (2011) analysis is more detailed than the Connelly et al. (2004) analysis, both indicated similar trends for sage-grouse populations in the Snake River Plain MZ.

Recently, Idaho BLM initiated a modeling effort to identify preliminary priority sage-grouse habitat (PPH) within the Snake River Plain MZ (Makela & Major, 2012). Priority habitat includes breeding, late brood-rearing, and winter concentration areas. Because priority habitat areas have the highest conservation value for maintaining the species and its habitat, it is BLM policy to identify these areas in collaboration with respective state wildlife agencies (as per WO IM 2010-071), and maintain, enhance, or restore conditions for greater sage-grouse and their habitat within PPH areas (as per WO IM 2012-043). Preliminary results indicate that the Owyhee River allotments encompass large and contiguous areas of PPH (Map WDLF-3).

Typically, sage-grouse in the vicinity of the Owyhee River allotments congregate on communal strutting grounds (i.e., leks) from April to early May. The nesting season occurs soon after, extending from May to early June. Broods remain with females for several more months as they move from early brood-rearing areas (e.g., forb- and insect-rich upland areas surrounding nest sites) to late brood-rearing and summer habitats (e.g., wet meadows and riparian areas) from June to August. Based on locations acquired through lek surveys, telemetry studies, and incidental observations, sage-grouse lekking, nesting, early and late brood-rearing, and winter habitats occur within the Owyhee River allotments to varying degrees.

<u>Columbia Spotted Frog</u>

The Great Basin Distinct Population Segment (DPS) of the Columbia spotted frog occurs in eastern Oregon, southwestern Idaho, and northern Nevada. On April 23, 1993, the USFWS submitted a finding to the Federal Register which found that listing the spotted frog in some parts of its range (i.e., Great Basin DPS) was warranted but precluded by the need to take action on other species. As a candidate species under the ESA, Columbia spotted frogs are awaiting review and additional information for potential listing as threatened or endangered.

The species is highly aquatic and is seldom found far from water. The largest populations occur in structurally complex wetlands with diverse pool and meadow components. Suitable sites contain shallow breeding pools and deeper water overwintering sites. Wet meadows, riparian wetlands, and stream courses are important as dispersal corridors among perennially occupied sites. Wetland and riparian habitat loss and degradation are the most serious threats to the maintenance of viable populations of spotted frogs (IDFG, 2006b). Potential habitat for Columbia spotted frogs occurs within the Owyhee River allotments.

<u>Pygmy rabbit</u>

The pygmy rabbit is a sagebrush-obligate species that requires tall stands of big sagebrush on deep, friable soils where they dig extensive burrow systems. These dense sagebrush habitats provide food and shelter throughout the year. During winter, pygmy rabbits are almost entirely dependent on sagebrush for food. Fragmentation of sagebrush habitats poses a threat to this species by isolating disjunct populations, increasing susceptibility to localized threats, and reducing gene flow among populations.

On September 30, 2010, the USFWS submitted a new finding to the Federal Register which found that listing the pygmy rabbit was not warranted at the time. As a BLM Type 2 sensitive species, BLM continues to manage the species to prevent future ESA listing. Habitat loss and fragmentation due to conversion of sagebrush to agriculture, wildfire, invasive plants, and conifer encroachment have been identified as some of the primary threats to pygmy rabbit populations (IDFG, 2006b).

A model created by Idaho BLM in 2009 suggests portions of the Owyhee River allotments have a moderate likelihood of core habitat presence (USDI BLM, unpublished data). Although dense, big sagebrush stands are common within the Owyhee River allotments, deep, friable soils are more limited and patchily distributed. Because pygmy rabbits have been documented in the Owyhee Uplands, some pygmy rabbits may occur in areas with suitable shrub steppe habitat.

Columbia River redband trout

Redband trout of the Columbia River Basin are also a BLM Type 2 sensitive species. BLM manages the species to prevent future ESA listing as threatened or endangered. This trout is the resident form of steelhead trout that historically returned from the ocean to spawn in streams throughout the Owyhee River watershed (now restricted by downstream dams). In the Owyhee Uplands, redband trout prefer cool streams with temperatures below 70° F (21° C). However, they can survive daily cyclic temperatures up to 80° F (27° C) for a short period of time (IDFG, 2006b). Habitat loss and fragmentation of currently occupied habitat are among the major threats identified as issues relevant to the maintenance of viable populations of redband trout. Redband trout have been documented in various rivers and streams in and around the Owyhee River allotments (Map WDLF-4).

Migratory Birds, Raptors, and other Birds (including Special Status Species)

A variety of special status bird species occur or are likely to occur within the Owyhee River allotments (Appendix L). The majority of these species are associated with shrub steppe, grassland, or riparian habitats. Brewer's sparrow, sage sparrow, and sage thrasher are heavily reliant on sagebrush steppe for nesting and foraging. Loggerhead shrike, black-throated sparrow, and green-tailed towhee are less reliant on sagebrush but are dependent on shrubland habitat. Grassland species include long-billed curlew and grasshopper sparrow. Brewer's blackbird, calliope hummingbird, and willow flycatcher typically are associated with riparian areas, and black tern, white-faced ibis and Wilson's phalarope are associated with ponds and wetlands. Cassin's finch, Lewis' woodpecker, and red-naped sapsucker prefer forest habitat. The juniper woodlands within the Owyhee River allotments provide substantial amounts of suitable habitat for these species.

Further consideration is given to avian species afforded special management emphasis under the Migratory Bird Treaty Act (MBTA). As of 2010, under a signed Memorandum of Understanding with the USFWS, the BLM has a responsibility to "as practical, protect, restore, and conserve habitat of migratory birds, addressing the responsibilities in Executive Order 13186" (USDI, 2010). The Owyhee River allotments may provide foraging and nesting habitat for up to 177 additional species of migratory birds (Appendix L).

The North American Bird Conservation Initiative (NABCI) is a comprehensive instrument by which government agencies, such as the BLM, and private partners can promote and achieve integrated continental bird conservation as specified by Executive Order 13186 and the BLM-USFWS Memorandum of Understanding. One product of the NABCI is the designation of Bird Conservation Regions (BCR) across North America. BCRs are ecologically distinct regions with similar avian communities, habitats, and management concerns developed as the primary unit within which issues are resolved, sustainable habitats are designed, and priority projects are initiated (NABCI-US, 2000). Within BCRs, regional partnerships, or joint ventures, identify Bird Habitat Conservation Areas (BHCA) in which to deliver and implement state or local bird conservation plans.

On a regional scale, the Owyhee River allotments fall within the Great Basin BCR. In addition, the Owyhee River allotments are within the more localized Owyhee BHCA. The Owyhee BHCA has been identified by the Intermountain West Joint Venture as an area of statewide importance for priority bird species where the opportunity for effective conservation activities exists. Within the Great Basin BCR and the Owyhee BHCA, partner agencies and organizations have compiled a list of continentally important bird species based on a variety of bird initiatives and plans (Appendix L).

The nesting requirements of many migratory birds are fulfilled within the Owyhee River allotments from late-April to mid-July and/or during spring and fall migrations. While some migratory bird species use a wide variety of habitats, others are more specialized. Several species can successfully nest and raise multiple broods during a single breeding season if suitable conditions exist. Bird species that utilize woodlands have benefitted from the recent expansion of juniper across thousands of acres of the Owyhee Uplands. Nevertheless, no bird species are considered juniper-obligates, and generally, as juniper densities increase, species diversity decreases (Miller, Bates, Svejcar, Pierson, & Eddleman, 2005). Grasslands and shrub steppe provide nesting and foraging habitat for the majority of migratory bird species within the Owyhee River allotments. Most of these ground nesting or shrub-dependent species rely on the vegetative structure and cover found in these habitat types for successful breeding. Among birds, grassland and shrubland species are declining faster than any other group of species in North America (Dobkin & Sauder, 2004) (Brennan & Kuvlesky, Jr., 2005).

Riparian habitats support the most diverse migratory bird communities in the arid and semiarid portions of the Intermountain West (Knopf, Johnson, Rich, & Samson, 1988) (Dobkin, 1994) (Dobkin, 1998). In addition, healthy riparian areas sustain high densities of breeding migratory birds (Mosconi & Hutto, 1982). In Idaho, 60 percent of migratory landbirds are associated with riparian habitats (IDFG, 1992), and one of the main reasons for the decline of migratory landbirds is the loss of riparian habitat (DeSante & George, 1994).

An assortment of raptor species occur or potentially occur within the Owyhee River allotments (Appendix L). The juniper woodlands, rock outcrops, and shrub steppe located within the Owyhee River allotments provide nesting and foraging substrate for many of these species. Generally, raptors return to areas in which they have nested in the past, often using the same nesting territories. Nesting activities may be initiated in mid-February to late April depending upon species. Nest occupation continues until chicks are fledged, which usually occurs from early June to mid-August. Raptor nesting is expected to occur in suitable habitats within the allotment.

Eagle species are afforded additional protection under the BGEPA. Although bald eagles have been documented near the allotments during winter months, their use of the area is not well known. However, bald eagle breeding within the Owyhee River allotments is highly improbable because of the lack of open water and nesting trees.

Golden eagles, prairie falcons, ferruginous hawks, and Swainson's hawks prefer open shrub steppe, sagebrush and grassland habitats. Golden eagles, ferruginous hawks, and prairie falcons nest on cliffs and rocky outcrops throughout southwest Idaho. All three species breed and forage in and/or around the Owyhee River allotments. Documented nest sites and potential nesting habitat for these species is abundant in the uplands and nearby deep canyons (i.e., Main, East, and South Forks of the Owyhee River, Deep and Battle Creeks). Prairie falcons prey on small mammals, especially ground squirrels, but a large portion of their diet also can be comprised of birds.

The *Accipiter* species (northern goshawk, Cooper's hawk, and sharp-shinned hawk) and most owls prefer mixed open forest to more dense forest. In semiarid areas, these species often focus hunting efforts in riparian areas due to the abundance of prey found there. Juniper woodlands also provide suitable foraging habitat. The expanding juniper woodlands in some of the Owyhee River allotments provide suitable foraging habitat for these species. Accipiters primarily prey upon birds but also will take small mammals.

Several species of owls that potential occur within the Owyhee River allotments include great horned owl, long-eared owl, northern saw-whet owl, and western screech owl; these species generally are associated with greater tree cover found in woodlands, forest, and riparian areas. Flammulated owls prefer dense forest and probably have occupied the area recently as juniper has expanded and become thicker.

A number of raptor species prefer open woodland or shrub steppe to dense forest. American kestrel, northern harrier, red-tailed hawk, short-eared owl, and western burrowing owl usually are found in more open areas such as sagebrush steppe, grasslands, meadows, or open riparian areas, and prey on a wide variety of small mammals, reptiles, birds, and insects. Northern harriers and short-eared owls are ground nesters and need adequate cover for suitable nest sites. Burrowing owls nest in burrows dug by other animals, usually badgers, and they hunt in grasslands and sagebrush steppe areas. Expansion of juniper woodlands probably has restricted the distribution of these open habitat species within parts of the Owyhee River allotments.

Big Game and other Mammals (including Special Status Species)

Several special status mammal species have been documented or have the potential to occur within the Owyhee River allotments (Appendix L). California bighorn sheep in the area inhabit the deep, rugged canyons of the Owyhee River system year round (Map WDLF-4). Although bighorn sheep forage in the adjacent uplands up to a mile from the canyon rims, they prefer the benches and terraces within the rugged canyons where escape terrain is readily available. In recent years, the local population (Owyhee River population management unit [PMU]) of approximately 250 to 350 California bighorn sheep has remained relatively stable (IDFG, 2010). The overall management goal for the Owyhee River PMU is to maintain or increase the current population; IDFG estimates the PMU is capable of supporting 400 to 700 sheep (IDFG, 2010).

Special status bat species occurring or potentially occurring within the Owyhee River allotments include fringed myotis, spotted bat, and Townsend’s big-eared bat. Although these species have been detected in the general area around the allotments, research conducted in the juniper woodlands in the Owyhee Uplands suggest that bat populations are not numerous and species diversity is low (Perkins & Peterson, 1997). Quality day-roosting habitat (particularly caves and large, mature, live cottonwoods and snags) appears to be a limiting factor for bats in the area. Although abundant, the cliffs, rock outcrops, and seral junipers found in the portions of the allotments only provide marginal roosting habitat (Perkins & Peterson, 1997). Because the effects of livestock grazing on bats are not well-known and old growth junipers would remain the most abundant day roost substrates in the area, effects to bats are expected to be negligible and will not be discussed further.

Kit fox and various special status small mammal species, including the Piute ground squirrel, dark kangaroo mouse, and Wyoming ground squirrel, have the potential to occur within the Owyhee River allotments. These species prefer open habitats including sagebrush steppe, salt desert scrub, grasslands, meadows and other productive bottomlands. As well as being major constituents to biodiversity, small mammals serve as predators, prey, seed dispersers, and grazers. An abundant and diverse small mammal community can be an indicator of a healthy and functioning ecosystem (Fricke, Kempema, & Powell, 2009).

The Owyhee River allotments have long supported populations of a wide variety of big game species. Rocky Mountain elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*) use portions of the area year-long. However, some areas are used specifically as seasonal ranges (i.e., spring, summer, fall, and winter). Most elk and mule deer north of the Owyhee River probably migrate to lower elevations in Oregon for winter, while elk and mule deer south of the Owyhee River either remain in the area or move into Nevada (IDFG, 2010a) (IDFG, 2010b). Nevertheless, mule deer are common year-round in the uplands and canyonlands within the allotments. Similarly, pronghorn occur year-round throughout the uplands in much of the Owyhee River allotments. Some specific pronghorn seasonal habitats (i.e., spring through fall) occur east of Juniper Mountain.

The Owyhee River allotments are located within the IDFG game management unit (GMU) 42. Current population data for elk and mule deer are lacking because surveys have not been conducted within GMU 42 for several decades (IDFG, 2000a) (IDFG, 2000b). Nevertheless, IDFG estimated the 2002 population at approximately 450 elk within GMUs 40 and 42; population objectives within GMU 42 are 190 to 275 elk (IDFG, 2010a). IDFG does not have any current population estimates for mule deer in GMU 42; managers have identified population information within the GMU as a primary data need in the future (IDFG, 2010b). The IDFG objective for mule deer within GMU 42 is to increase populations within these important herds (IDFG, 2010b). Pronghorn surveys were conducted in GMU 42 in 2009; more than 1,500 pronghorn were observed (IDFG, 2010c). Besides maintaining a variety of hunting opportunities and average horn lengths, IDFG has no explicit population objectives for pronghorn within GMU 42 (IDFG, 2010c).

While juniper provides hiding and thermal cover for elk and deer, juniper encroachment reduces forage and habitat diversity. Browse species important to deer, such as mountain big sagebrush, mountain mahogany, and bitterbrush, have decreased in juniper encroachment areas. Pronghorn probably used the entire Juniper Mountain area when vegetation consisted mainly of open grassland and shrubs; however, pronghorn use has currently been reduced due to the increase in juniper woodlands. Even though population declines were noted in the Juniper Mountain Wildlife Habitat Plan (JMWHP), pronghorn were more plentiful in the past (USDI BLM, 1969). The plan documented degraded range conditions and competition for forage as the reasons for pronghorn decline.

Large predators that occur within the Owyhee River allotments include bobcat (*Lynx rufus*), coyote (*Canis latrans*), and mountain lion (*Puma concolor*). These predators are quite secretive and elusive. Because of their secretive nature, predator densities are difficult to determine. However, predators are closely tied to their prey, and if prey numbers are low, predator numbers would reflect that. Because these species are relatively common and abundant habitat exists in the area, they will not be discussed further.

Beavers (*Castor canadensis*) are not as widespread throughout the area as they once were. The JMWHP identified that limited populations of beaver were present along some of the streams in the area (USDI BLM, 1969). However, habitat along many of the streams had deteriorated to the point that only remnant populations remained. Habitat for beavers in the Owyhee River allotments has been affected by livestock use and encroachment of juniper. Loss of aspen, cottonwood, and willow trees has affected beaver by reducing suitable forage and material for building dams to create pond habitat. The loss of beavers throughout much of the area is suspected of leading to declines in spotted frog numbers.

Amphibians and Reptiles (including Special Status Species)

Several special status amphibians and reptiles, including the northern leopard frog, western toad, and common garter snake, have been documented or have the potential to occur within the Owyhee River allotments (Appendix L). All three species prefer habitats in proximity to water, including springs, streams, wetlands, and meadows. Loss and degradation of riparian-wetland habitats are the most serious threats to the maintenance of viable populations of these species. Because very little is known about amphibian (with the exception of spotted frogs) and reptile populations in the Owyhee River allotments, individual species will not be discussed in detail further. Amphibian and reptile habitat in general will be included in discussions under spotted frogs and in the broader context of upland and riparian habitat conditions.

Fisheries
Other fish species that occur or potentially occur within streams in the Owyhee River allotments include smallmouth bass (*Micropterus dolomieui*), dace (*Rhinichthys* spp.), redside shiner (*Richardsonius bateatus*), sculpin (*Cottus* spp.), and suckers (*Catostomus* spp.) (Idaho DEQ, 2002) (IDFG, unpublished data). Fish habitat within the majority of the streams with the potential to support a fishery is degraded due to grazing effects in riparian areas and juniper encroachment (USDI BLM, 2012a). These species will not be discussed further, as fish habitat in general will be included in detailed discussions under redband trout.

Desired Conditions for Wildlife and Special Status Animal Species Habitat
The appropriate structure, function, and composition of native upland and riparian vegetation communities are necessary to ensure the proper functioning of ecological processes and continued diversity and productivity of plant species. Vegetation communities meeting these desired conditions provide habitats suitable for the maintenance of viable wildlife populations, including threatened and endangered, sensitive, and other special status species (Appendix A).

Wildlife habitats should be managed to maintain or enhance the condition, abundance, and structural stage and distribution of plant communities and special habitat features required to support a high diversity and desired populations of wildlife species (USDI BLM, 1999a). In addition, perennial stream and riparian areas should be improved or maintained to provide satisfactory conditions to support native fish. Special status species and their habitats should be managed to increase or maintain populations at levels where their existence is no longer threatened and listing under the ESA is unnecessary. Grazing management practices should provide sufficient residual vegetation to improve, restore, or maintain the physical and biological conditions (e.g., hydrologic cycle, nutrient cycle, and energy flow) necessary to sustain wildlife habitats in properly functioning, structurally appropriate, and diverse native upland and riparian plant communities.

Indicators used to assess the condition and quality of wildlife habitats include productivity and diversity of native plant and animal communities, site-appropriate age class and structural diversity of plant species, site-appropriate amount and distribution of ground cover (including litter), presence of deep-rooted, stabilizing riparian vegetation, and water quality (Appendix A).

3.3.1.6 Economic and Social Values

Affected Environment

This socioeconomic analysis will focus primarily on Owyhee County, Idaho, where all of the Owyhee River allotments are located, but as some of the livestock operators who own the cattle maintain base ranches in Jordan Valley, Oregon, (Malheur County) or Tuscarora, Nevada (Elko County), these two counties will also be included in the analysis.

Owyhee County is the second-largest county in the state and covers 7,639 square miles. The population in Owyhee County in 2010 was 11,389, an increase of 7 percent from the year 2000, compared to an 18 percent increase throughout the state of Idaho over that same time period. The population density is only 1.5 people per square mile, and most of the county residents enjoy a largely rural lifestyle. Residents of the Treasure Valley come to the public lands to recreate on weekends and during hunting and fishing seasons. In 2010, the median age in the county was 35.3 years, almost three years older than the median age in 2000 and close to the median age of 36.3 for the entire state. Almost one-third of county residents are under the age of 18 and more than 20 percent of residents are age 45 to 64. The population in the baby boomer generation increased almost 26 percent from 2000 to 2010. Southwest Idaho is projected to grow by more than 95,000 people by the year 2020, and 77,000 of these people will live in Ada or Canyon Counties (Gardner & Zelus, 2009).

Economic profiles

Unemployment in Owyhee County in 2010 was 11 percent, compared to 8.8 percent in Idaho and 9.6 percent nationwide in the same year. Incomes are much lower in Owyhee County than in Idaho, possibly due to employment primarily in lower-paying sectors like agriculture and social services. In 2010, the per capita income for Owyhee County was $17,373, with a median household income of $33,441; per capita income for the state was $22,518 and median household income was $46,423 (U.S. Census Bureau, 2012). More than 20 percent of people in Owyhee County live below the poverty level, which is a higher rate than Idaho’s poverty rate. Table SOCE-1 shows the unemployment rate, per capita income, median household income, and poverty rate of Owyhee, Malheur, and Elko counties. Overall, Elko County was economically stronger during the period from 2006 to 2010 than Owyhee and Malheur counties, possibly due to the jobs and income the mining industry brings to the county.

Table SOCE-1: Economic statistics for populations in Owyhee, Malheur, and Elko counties

Location	**Unemployment rate**	**Per capita income**	**Median household income (2010 dollars)**	**All people below poverty rate**
Owyhee County, ID	11%	$17,373	$33,441	22.2%
Malheur County, OR	10.3%	$16,335	$39,144	22.7%
Elko County, NV	4.6%	$26,879	$67,038	7.1%

Source: U.S. Census Bureau, 2006-2010 American Community Survey

Agriculture (including livestock ranching), natural resource management, education and social services are the primary sectors for employment in Owyhee, Malheur, and Elko counties, although manufacturing and retail trade also employ many residents in the counties (Table SOCE-2). Malheur County in southeastern Oregon covers 9,887 square miles and is 94 percent rangeland, two-thirds of which are managed by the BLM (Malheur County, Ore., 2012). Population density was 3.2 persons per square mile in 2010. Although education, health care and social services together employ almost one-fourth of the county’s residents (U.S. Census Bureau, 2011), irrigated fields in the northeast corner of the county allow for intensive and diversified farming, and residents of the Treasure Valley in Oregon and Idaho support businesses connected to hunting, fishing, golfing, camping, hiking, and water-related activities. Elko County, Nevada, the fourth largest county in the lower 48 states in terms of geographic size, covers 17,169 square miles and is more rural than Malheur County, with 2.8 persons per square mile in 2010 (U.S. Census Bureau, 2011). According to the Elko County Economic Diversification Authority (ECEDA, 2012), the county is the fourth-largest gold-producing area in the world, and the mining industry is one of the largest sources of employment in the county, with eight mines that produce gold, silver, barite, and limestone in 2010 (Driesner & Coyner, 2011).

Table SOCE-2: County employment by industry (2006-2010 average)

Industry	**Owyhee County, Idaho**	**Malheur County, Oregon**	**Elko County, Nevada**	**United States**
Civilian employed population 16 years and over	4,448	11,487	24,256	141,833,331
Agriculture, forestry, fishing and hunting,	19.4%	12.4%	22.8%	1.9%

Industry	Owyhee County, Idaho	Malheur County, Oregon	Elko County, Nevada	United States
and mining				
Construction	12.6%	7.1%	8.3%	7.1%
Manufacturing	9.0%	10.0%	2.3%	11.0%
Wholesale trade	1.6%	4.4%	2.3%	3.1%
Retail trade	8.3%	10.7%	7.0%	11.5%
Transportation and warehousing, and utilities	6.3%	3.4%	4.3%	5.1%
Information	1.0%	1.3%	1.0%	2.4%
Finance and insurance, and real estate and rental and leasing	4.2%	4.1%	3.3%	7.0%
Professional, scientific, and management, and administrative and waste management services	2.9%	4.2%	5.1%	10.4%
Educational services, and health care and social assistance	19.7%	23.1%	14.6%	22.1%
Arts, entertainment, and recreation, and accommodation and food services	5.7%	7.6%	19.0%	8.9%
Other services, except public administration	3.3%	3.8%	3.9%	4.9%
Public administration	5.9%	7.9%	6.0%	4.8%

Source: U.S. Census Bureau, 2006-2010 American Community Survey

Economic Contribution of Livestock Grazing

The federal government manages 78 percent of the total land in Owyhee County; the BLM manages 75.9 percent of all federal land in the county. Ninety-three percent of the total federal land in the county is managed for commodity production (timber harvest, crop and livestock production, and mining) and 7 percent is managed primarily for natural, cultural, and recreational activities (EPS-HDT, 2012).

Table SOCE-3 shows the industry classification (based on the North American Industry Classification System (NAICS)) for farms located in Owyhee, Elko, and Malheur counties, as well as the nation as a whole in 2007. Individual farms may engage in various types of agriculture (both crops and livestock), but these classifications provide insight into the likely primary agriculture activity for the farms surveyed in the 2007 USDA Census of Agriculture. As shown in the table, the proportion of farms classified as beef cattle ranching and farming operations substantially exceeds the national average.

Table SOCE-3: Number of Farms by Type, 2007

	Owyhee County, ID	Elko County, NV	Malheur County, OR	County Region	U.S.
All Farms	620	456	1,250	2,326	2,204,792
Oilseed & Grain Farming	40	0	74	114	338,237
Vegetable & Melon Farming	10	1	57	68	40,589
Fruit & Nut Tree Farming	4	1	8	13	98,281
Greenhouse, Nursery, etc.	4	2	8	14	54,889

	Owyhee County, ID	Elko County, NV	Malheur County, OR	County Region	U.S.
Other Crop Farming	185	54	388	627	519,893
Beef Cattle Ranch. & Farm.	247	266	492	1,005	656,475
Cattle Feedlots	8	2	34	44	31,065
Dairy Cattle & Milk Prod.	23	0	35	58	57,318
Hog & Pig Farming	4	0	10	14	30,546
Poultry & Egg Production	6	4	4	14	64,570
Sheep & Goat Farming	30	19	40	89	67,254
Animal Aquaculture & Other Animal Prod.	59	107	100	266	245,675
Percent of Total					
Oilseed & Grain Farming	6.5%	0.0%	5.9%	4.9%	15.3%
Vegetable & Melon Farming	1.6%	0.2%	4.6%	2.9%	1.8%
Fruit & Nut Tree Farming	0.6%	0.2%	0.6%	0.6%	4.5%
Greenhouse, Nursery, etc.	0.6%	0.4%	0.6%	0.6%	2.5%
Other Crop Farming	29.8%	11.8%	31.0%	27.0%	23.6%
Beef Cattle Ranch. & Farm.	39.8%	58.3%	39.4%	43.2%	29.8%
Cattle Feedlots	1.3%	0.4%	2.7%	1.9%	1.4%
Dairy Cattle & Milk Prod.	3.7%	0.0%	2.8%	2.5%	2.6%
Hog & Pig Farming	0.6%	0.0%	0.8%	0.6%	1.4%
Poultry & Egg Production	1.0%	0.9%	0.3%	0.6%	2.9%
Sheep & Goat Farming	4.8%	4.2%	3.2%	3.8%	3.1%
Aquaculture & Other Prod.	9.5%	23.5%	8.0%	11.4%	11.1%

Source: (EPS-HDT, 2012)

Table SOCE-4 shows county-level economic information for 2011 based on data from the Bureau of Economic Analysis. While total earnings in Owyhee County are substantially less than those of Malheur and Elko counties, farm earnings in Owyhee County are more than triple those of Malheur County and more than four times that earned in Elko County. More than half of the earnings generated in Owyhee County come from farming, compared to just under 6 percent in Malheur County and about 1.5 percent in Elko County.

In terms of employment, the farming section accounts for more than one-quarter of the jobs in Owyhee County, more than 10 percent of the jobs in Malheur County, and about 2.5 percent of the jobs in Elko County.

In all three counties, more than half of the cash receipts generated by farms come from livestock and products. In Elko County, the proportion exceeds 90 percent.

Table SOCE-4: Farm Earnings, Employment, and Cash Receipts (2011)

	Owyhee Co. (ID)	Malheur Co. (OR)	Elko Co. (NV)
Total earnings by place of work (million dollars)[1]	$198.5	$578.8	$1,396.5
Farm earnings (million dollars)	$107.3	$33.3	$21.2
Farm earnings (%)	54.0%	5.7%	1.5%
Total employment[2]	4,262	17,235	26,666
Farm employment	1,123	2,098	635
Farm employment (%)	26.3%	12.2%	2.4%
Farm cash receipts and other income (million dollars)[3]	$345.3	$374.5	$76.4
Livestock and products (%)	58.6%	59.2%	92.6%
Crops (%)	37.6%	36.1%	4.1%
Other (%)	3.8%	4.7%	3.4%

Source:
1 Bureau of Economic Analysis, Regional Economic Information System (BEA-REIS). 2012. Table CA05: Personal income by major source and earnings by NAICS industry.
2 Bureau of Economic Analysis, Regional Economic Information System (BEA-REIS). 2012. Table CA25N: Total full-time and part-time employment by NAICS industry.
3 Bureau of Economic Analysis, Regional Economic Information System (BEA-REIS). 2012. Table CA45 Farm income and expenses.

Data from the Bureau of Labor Statistics (BLS) indicate that the average annual income of individuals employed in occupations related to animal production earned approximately $36,047, $28,987, and $22,704 in Owyhee, Malheur, and Elko counties, respectively, in 2011.

In accordance with the Owyhee Resource Management Plan (USDI BLM, 1999a), livestock grazing is available within the four Owyhee River allotments. That land use planning effort, completed in 1999, removed allocation for livestock grazing from lands below the canyon rims adjacent to reaches of the Owyhee River and South Fork Owyhee River. As a result, Owyhee River canyonlands adjacent to the Castlehead-Lambert and the Garat allotments are not allocated for livestock grazing.

Additionally, the ORMP identified the active authorized use for livestock within the ORMP planning area upon implementation of the plan. The plan further identified that authorized active use would be adjusted through the life of the plan based on monitoring and assessment to determine future stocking levels. Stocking levels necessary to meet objectives[26] were projected to be reduced from 135,116 upon implementation of the ORMP in 1999 to 112,647 AUMs in 2004 and 105,899 AUMs in 2019. These projected levels of authorized active use compare to an average actual use of 96,676 AUMs during the years 1988 through 1997.

Permittees use the Castlehead-Lambert, Garat, and Swisher allotments for cattle grazing during the grazing season and are relocated to other lands in the late fall and winter to feed. These lands could include state land, the grazing operators' base ranches in Jordan Valley and Tuscarora or other private

[26] The ORMP objective for livestock grazing management is to provide for a sustained level of livestock use compatible with meeting other resource management objectives. In addition, the objective is to resolve issues associated with livestock grazing identified in the allotment management summary (Appendix LVST-1 of the ORMP).

land. Table SOCE-5 shows the number of acres in each of the Owyhee River allotments and in the total Owyhee Resource Area.

Table SOCE-5: Federal, state, and private acreage in the Owyhee River allotments

	Castlehead-Lambert^	**Garat^**	**Swisher Springs^**	**Swisher FFR^**	**Owyhee Resource Area***
Federal	45,826 acres	202,618 acres	3,694 acres	153 acres	1,298,728 acres
State	217 acres	8,836 acres	0 acres	0 acres	118,774 acres
Private	3 acres	207 acres	0 acres	628 acres	187,651 acres
Total	46,046 acres	211,661 acres	3,694 acres	781 acres	1,605,155 acres

^Source: 2012 Rangeland Health Assessment/Evaluation Reports for each allotment

*Source: Owyhee Resource Management Plan

In 2010, livestock cash receipts in the state of Idaho totaled $1.2 billion, an increase of 26 percent over the previous year (USDA NASS, 2011). According to the 2007 USDA Census of Agriculture, the most recent year the census was taken, (USDA NASS, 2009) 134,732 cattle and calves were sold in Owyhee County that year, which brought almost $67 million to the county that year, an average of $497 per head. In the state of Idaho, 1.8 million cattle and calves were sold that same year, totaling more than $1.3 billion, an average of $756 per head. However, most of the grazing operations with livestock on the Owyhee River area allotments are family-owned ranches based in Jordan Valley, Oregon, although livestock that graze on the Garat allotment are owned by Petan Co. of Nevada, Inc., which is based in Tuscarora, Nevada. Thus, although the livestock graze in Idaho, income from the sales of those livestock goes to the counties in which the livestock operations are based. In 2007, sales of 203,743 cattle and calves in Malheur County totaled $179 million and sales of 79,184 cattle and calves in Elko County totaled $48 million (USDA NASS, 2009). Livestock operation owners may still do business in Idaho, especially while the animals are actively grazing on the allotments, by purchasing supplies, equipment, and gasoline for vehicles, as well as visiting local establishments for food and entertainment. Research completed in 1999 estimated that livestock grazing contributed $66.94/AUM to the Owyhee County economy (Darden, Harris, Rimbey, & Harp , 1999): $46.85/AUM as a direct impact to ranches and $16.22/AUM as indirect/induced effects to other sectors in the local economy. Indirect and induced economic effects to the regional economy include supply purchases (such as hay, equipment, etc.) and from the labor income expenditures by ranch employees and by employees of suppliers. These numbers provide a means of comparing effects to the local economy from changes in livestock grazing management, but actual economic impacts may vary by ranch and county.

The BLM collects annual grazing fees from the operators based on the number of AUMs they are permitted. An AUM represents the amount of dry forage required to sustain one cow and her calf, one steer, one horse, five sheep, or five goats for one month. The ORMP provides 135,116 active permitted AUMs for all of the allotments in the Owyhee Resource Area. Tables SOCE-6 through SOCE-8 show the active use, suspension, and permitted use AUMs for each of the Owyhee River area allotments under the current permit. As defined by the Taylor Grazing Act of 1934, active use is the current authorized use, which includes livestock grazing. Suspension is the temporary withholding of active use, and permitted use is the forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease. At the current rate of $1.35 per AUM, these allotments can generate $22,152 per year from active-use AUMs (based on the number of AUMs authorized in Alternative 1). The BLM distributes 50 percent of the grazing revenues to range betterment projects, 37.5 percent remains in the U.S. Treasury, and 12.5 percent is returned to the state (43 USC Chapter 8A, 1934). In addition, the BLM contributes payments in lieu of taxes (PILT), which totaled more than $9.5 million in Owyhee County from 2003 to 2012, for an average of about $956,000 per year[27].

Table SOCE-6: Castlehead-Lambert allotment currently permitted AUMs

Permittee	Active Use	Suspension	Permitted Use
06 Livestock Co.	2,545 AUMs	642 AUMs	3,187 AUMs
Teo and Sarah Maestrejuan	1,733 AUMs	404 AUMs	2,137 AUMs

Source: (USDI BLM, 2012a)

Table SOCE-7: Garat allotment currently permitted AUMs

Permittee	Active Use	Suspension	Permitted Use
Petan Co. of Nevada, Inc.	22,750 AUMs	10,896 AUMs	33,646 AUMs

Source: (USDI BLM, 2012b)

Table SOCE-8: Swisher Springs/FFR allotment currently permitted AUMs

Permittee	Allotment	Active Use	Suspension	Permitted Use
06 Livestock Co.	Swisher Springs	345	192	537
06 Livestock Co.	Swisher FFR	15	0	15

Source: (USDI BLM, 2012c)

Non-market values of ranching

Most environmental goods and services (e.g., clean air and water, fish and wildlife habitat, recreational and aesthetic values) are not traded in markets, so it is difficult to place a monetary value on the protection or degradation of natural resources that provide these goods and services. In many cases, a method called hedonic pricing can attempt to estimate a value of the goods and services an ecosystem provides by examining the amount of money that people would be willing to pay when the characteristics of the service change. For example, the value of the ecosystem services that support recreational activities (e.g., clean air and water that supports habitat for fish and wildlife, which in turn provides hunting, fishing, and wildlife watching opportunities) can be estimated by examining average expenditures for travel, equipment, and supplies for these recreational activities in an area (see tables SOCE-9 and 10 below). People may spend less time and money on recreational activities in areas where the natural resources have become degraded. The Group 1 Owyhee River allotments provide opportunities for recreation such as ORV use, fishing, hunting, boating, camping, and wildlife-watching (see Recreation, Visual Resource, ACEC, Wilderness and Wild and Scenic Rivers, and Lands with Wilderness Characteristics sections in this EA); however, degraded conditions caused by fires and livestock grazing-related activities can reduce wildlife habitat, muddy streams and rivers, and diminish scenic values, all of which can lead to less recreation and thus less money spent in the counties adjacent to these allotments.

Other intangible values associated with ecosystems services include social values of natural resource use – the sense of community cohesiveness and belonging that comes from participating in recreational activities, as well as farming and ranching. Degraded conditions, as mentioned above and in the resource

[27] Based on BLM data retrieved at http://www.doi.gov/pilt/county-payments.cfm?term=county&state_code=ID&fiscal_yr=2012

impact analysis sections of this EA, lessen the quality of the land and forage available for growing crops or feeding livestock, which can also have economic impacts on the producers of these goods in the counties adjacent to the Group 1 allotments. Ecosystems services also have value beyond providing for the uses discussed in this EA. As noted in (Beschta, et al., 2012), providing for healthy, functioning ecosystems can contribute to a greater resilience to extreme events like fires and storms, as well as the long-term impacts of climate change.

Recreation

Residents in nearby counties in Idaho, Oregon, and Nevada engage in fishing, hunting, boating, off-highway vehicle use, camping, wildlife watching, and winter sports throughout the Owyhee Resource Area. Studies conducted in 1995 identified visitor day values and net willingness-to-pay values for recreation here. Table SOCE-9 depicts the value recreationists place on these activities, rather than the actual expenditures. As mentioned above, there are few or no suppliers for recreational equipment in Owyhee County, so most expenditures for this equipment would occur outside the county and likely would not have much of an impact on the local economy, although recreationists would spend money on gasoline and groceries within Owyhee County. However, recreation presents some costs to the county. According to a 2003 report on the social and community aspects of public land grazing policy alternatives (Wulfhorst, Rimbey, & Darden, 2003), the limited staff of the county Sheriff's department is often overwhelmed with requests from recreational users who are lost, having mechanical problems, or injured. Search-and-rescue efforts often draw in community members who have more familiarity with the landscape than the out-of-town users with little knowledge of the area. Each call to help someone hurt, lost, or stranded in the backcountry costs money. In FY2003, search-and-rescue supplies totaled $1,000 of the $13,600 budget for the patrol component of the Sheriff's budget, and additional staff members are hired seasonally to respond to incidents (Wulfhorst, Rimbey, & Darden, 2003). The state of Idaho reimburses counties up to $4,000 per incident to cover some of the costs for volunteer-related expenses and the Sheriff bills the BLM for backcountry patrols. State funds come from the state gas tax and vehicle registrations. However, some county residents are uncomfortable with the idea of state resources being used to rescue recreationists who come from outside the county; attempts to recover costs ($500 each) from those rescued have been successful only about half the time.

Table SOCE-9: Net willingness-to-pay recreation value for the Owyhee Resource Area

Activity	1995 Value
Deer hunting	$40.02
Elk hunting	52.42
Antelope hunting	80.47
Other big game	53.65
Waterfowl hunting	42.48
Upland and small game	42.47
Warm-water fishing	39.28
Cold-water fishing	38.08
Developed site recreation	7.45
Disbursed use recreation	4.47
Non-game viewing, photography	28.31

Source: (USDI BLM, 1999b)

Table SOCE-10: Owyhee Resource Area Estimated Recreation Use and Value (1995)

Activity*	**Visitor Days**	**1995 Value**
Hunting	70,722	$3,816,617
Fishing	11,109	429,682
Off-highway vehicles	24,600	696,412
Other motorized use	22,616	640,266
Non-motorized use	10,669	47,689
Camping	39,107	291,344
Other land-based	36,740	717,113
Whitewater boating	1,368	38,714
Other water-based	1,057	29,917
Snowmobiling	2,301	10,285
Other winter sports	423	1,891
Total	**220,712**	**$6,719,930**

*Based on 8 hours per visitor day
Source: (USDI BLM, 1999b)

Social Value of Ranching

As noted in the Owyhee County Natural Resources Plan (Owyhee County Commissioners, 2009) livestock grazing often plays an important social role in this area, in addition to contributing economically. It has been an important component of the local economy in Owyhee County since the late 1860s, when the establishment of the southern Idaho railroad coincided with the migration of sheep through the Owyhee Mountains to Elko, Nevada. Horses and cattle were also introduced in the Owyhee Mountains at that time, and residents of rural Oregon, Idaho, and Nevada have since identified with the tradition, land use, and history of ranching in these areas. Maintaining the land in agriculture and ranching preserves the rural character and small-community feel, keeps the cost of living lower, and provides ample opportunities for recreation. Harp and Rimbey (2004) found that in communities in Owyhee County where ranching was an essential component, community members felt a much greater connection to each other, to the ranchers, and to local business owners. Among the Owyhee County communities surveyed for the study, Jordan Valley and Marsing communities scored higher in terms of community cohesion, owed at least in part to the large role that ranching plays in each of these communities. Closing a ranch in Jordan Valley, Marsing, or Elko County could have substantial negative effects socially.

Environmental Justice

The Executive Order 12898 of February 11, 1994, established the requirement to address environmental justice concerns within the context of federal agency operations. This means that agencies must:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- Ensure the full and fair participation by all potentially affected communities in the decision-making process; and
- Prevent the denial of, reduction in or significant delay in the receipt of benefits of the project by minority and low-income populations.

Evaluation of these impacts requires the identification of minority and low-income populations (including Native American tribes) within the affected area and evaluation of the potential for the alternatives to have disproportionately high and adverse impacts on such populations. Low-income populations are determined based on annual statistical poverty thresholds developed by the Bureau of Census. A low-income community may include either a group of individuals living in geographic proximity to one another or dispersed individuals (such as migrant workers or Native Americans) where the group experiences a common effect or environmental exposure. Minorities are individuals who are members of the following population groups: American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic. (Council on Environmental Quality, 1997)

Table SOCE-1 above shows the median household incomes and poverty rates for all three counties addressed in this document. It is likely that the incomes are higher and poverty rates are lower in Elko County due to the mining industry's contribution to the economy in that county. Owyhee and Malheur counties are largely agriculturally based economies, so incomes are lower and poverty rates are higher.

Table SOCE-11 shows the breakdown in race and ethnicity for all three counties. None of the counties has a minority population that exceeds 50 percent, and the proportion of minorities in Elko County is lower than the proportions for Nevada (45.9 percent). However, the proportion of minorities in Owyhee County and Malheur County are higher than the proportions for Idaho (16 percent) and Oregon (21.4 percent), respectively. Crop producers and livestock operations in the United States commonly and legally employ citizens of Mexico and various Latin American countries, and most of these individuals would be classified as minority. Some proportion of the minority populations in Owyhee County and Malheur County could be employed by crop producers and livestock operators, so changes in livestock grazing in these counties could affect some members of the minority communities there.

Table SOCE-11: Race/ethnicity distribution

	Owyhee County	**Malheur County**	**Elko County**
Total	11,389.0	31,326.0	47,707.0
Population by race			
White alone	69.2%	64.4%	69.7%
Black or African American alone	0.1%	0.1%	0.7%
American Indian and Alaska Native alone	3.1%	0.5%	4.8%
Asian alone	0.0%	0.9%	1.1%
Native Hawaiian and other Pacific Islander alone	0.0%	0.1%	0.2%
Some other race alone	0.0%	0.1%	0.1%
Two or more races	3.2%	2.7%	1.2%
Population by ethnicity			
Hispanic or Latino	24.4%	30.3%	22.3%
Minority	30.82%	35.60%	30.33%

Source: U.S. Census Bureau, 2006-2010 American Community Survey

Effects Common to All Allotments

A number of alternatives call for reductions in AUMs on some or all of the allotments. In some cases, as described below, some operators could incur additional costs from alternative forage options due to changes in livestock numbers or management practices. These costs could include:

- Different AUM fees: Private land AUM fees in 2011 were $14.50/AUM in Idaho, $13.00/AUM in Nevada, and $14.80/AUM in Oregon, plus transportation costs. AUM fees on state-owned land in 2012 are $5.25/AUM in Idaho and $8.48/AUM in Oregon[28]. AUM fees on state-owned land in Nevada are determined by either a minimum grazing fee or a base value. The 10-year (2002-2011) average market value of an AUM in Idaho is $12.67/AUM[29], which is an estimate based on survey indications of monthly lease rates for private, non-irrigated grazing land.
- Feeding hay on the ranch instead of grazing on pastures: The operators would need 780 lbs. (0.4 tons) dry forage/month for each cow and her calf if the herd were moved back to the ranch instead of to other grazing land. The 10-year (2003-2012) average price for alfalfa hay was $138/ton in Idaho, $148/ton in Oregon, and $138/ton in Nevada[30]. This means that the operator would spend up to $58/month ($693/year) on dry forage for each cow and her calf.

There may be other costs associated with changes in livestock numbers or management practices that could affect the operators' bottom lines and the community as a whole. For example, Torell and others (2002) found that a 50 percent reduction in BLM AUMs in the Jordan Valley area resulted in a reduction in net annual ranch returns of $2.41 per AUM removed; reductions of 75 percent and 100 percent resulted in net ranch return reductions of $2.94 per AUM removed and $3.44 per AUM removed (respectively). The authors also found that removing spring grazing on BLM land in the Jordan Valley area would reduce an operator's net cash income by $24.17 per AUM removed. If the operator grazed on private pasture or fed the animals at the ranch during the spring, the negative impact would be lower ($5.34/AUM removed) (Torell, et al., 2002). However, it is possible that one or more of the operators might find that such a large percentage of the herd would need to be moved or sold that operating the ranch would no longer be economically feasible. Any cuts in AUMs would lead to increased expenses for grazing and/or feed that could be detrimental to the viability of the ranch. This would lead to losses in jobs, income to the community, and tax revenue for the county and state. Additionally, ranching is so intimately connected to the overall culture in the areas in and around Owyhee County that the closing of a ranch would lead to a substantial loss of community cohesion. The closing of a ranch in Jordan Valley or Marsing could be viewed by community members as an adverse effect on the social conditions of the local community.

Alternative 1

This alternative would authorize grazing at levels equivalent to the maximum actual use reported at some point during the current permit with the same terms and conditions as the previous permit. If the operators used the maximum actual use AUMs, there would be no change in the number of animals grazed on any of the allotments or the season of use; thus, there would likely be few or no socioeconomic impacts on this allotment. The socioeconomic impacts of these changes will be outlined in the relevant allotment sections below.

---

[28] Although the cost per AUM ($1.35/AUM) on federal land is, at face value, much lower than private lands, operators who graze on federal or state lands also incur various operational costs in addition to the grazing fees. These costs are built into the estimates for grazing fees on private lands.

[29] The 10-year average market value was derived from USDA NASS survey, found at http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1002 and in the Idaho BLM project record by request.

[30] Hay prices based on USDA NASS data; breakdown of hay prices by month for 2003-2012 are available from the BLM Idaho project record by request.

Alternative 2
This alternative outlines the grazing management regime requested in the permittees' applications. The socioeconomic impacts of these changes will be outlined in the relevant allotment sections below.

Alternative 3
This alternative renews the livestock grazing permits on this allotment with the same terms and conditions as the current permit, with the addition of performance-based criteria in the terms and conditions. The permittees are provided the flexibility to meet resource condition, AUM, and season-of-use requirements through a number of possible actions, which allows them to make decisions based on what would be most economically and logistically feasible and could help keep management costs low.

It is not possible to assess the specific socioeconomic impacts that would result from this alternative because there are a variety of different actions that the ranchers could take, but impacts that could result from some of the possible actions can be estimated. The ranches are run as businesses, and this analysis is based on the assumption that the ranchers will make decisions based on what will be good for their business. The actions listed below are just a sample and do not constitute the full range of possible actions that any rancher might take, given the complexity of ranching operations.

Possible actions include:

- The operator could continue to take the same actions as in previous years, as long as he or she is operating within the sideboards as written in the permit. If this continues, the socioeconomic impacts would remain the same (i.e., the operator would continue contributing to employment and the purchase and sale of goods and services in the county where the ranch is located).
- This alternative allows for an increase in animals (compared to Alternative 1) on all of the allotments, so the operator could purchase more animals if he or she believed that it would still be possible to operate within the sideboards as written in the permit. If this occurred, the operator would incur additional costs through purchases of the animals, transportation, feed, and veterinary care of those animals, and possibly additional labor. However, these costs could be recovered when the animals are sold. Again, money spent on the additional animals would be infused into the local economy.
- If the operator found that in order to abide by the terms and conditions included in the permit, there is no longer sufficient forage for the entire herd on federal lands for the entire grazing season, he or she could move the animals to state or private land early, in which case there could be additional transportation costs to move the animals. If the animals were moved to state or private grazing land outside the ranch, the operator would pay higher rates for grazing fees (although, as noted above, grazing fees for public lands do not include additional costs for maintenance that would be borne by the operators), and if the animals were moved back to the ranch and fed hay or grain, the operator might need to purchase additional feed for the animals. Money spent on supplies would go into economy near the new location, which could be different from where federal allotments are located.
- If, due to the sideboard restrictions, there is no longer sufficient forage for all of the animals in the herd for the entire length of the grazing season and moving the animals off the allotment is not feasible, the operator could sell some animals. The operator would no longer have to pay for feed and upkeep for those animals that are sold, so equipment, feed, and veterinary bills would be lower and less labor would be needed, but less money would filter into the local economy as a result. In addition, if the animals are sold prior to the date the operator had budgeted, the animals might be of a lower weight and would receive a lower price.

  It is possible that the operator might find that such a large percentage of the herd would need to be moved or sold that operating the ranch would no longer be economically feasible and would instead close the ranch altogether. Any cuts in AUMs would lead to increased expenses for grazing and/or feed that could be detrimental to the viability of the ranch. This would lead to losses in jobs, income to the community, and tax revenue for the county and state. Additionally, ranching is so intimately connected to the overall culture in the areas in and around Owyhee County that the closing of a ranch would lead to a significant loss of community cohesion.

Removing livestock from the allotment may have other impacts beyond ranching as well. Without livestock concerns, there could be more opportunities for recreation on BLM land, and thus the potential for more economic contribution from recreational activities through recreation fees collected and goods and services purchased. However, as noted in the ORMP EIS (USDI BLM, 1999b), most or all of the recreation-related goods and services are purchased outside of Owyhee County. In addition, the BLM does not collect day use fees for lands within its jurisdiction in Owyhee County, so the economic contribution from recreation in this county likely would be minimal. As noted above, additional recreation in the county will tax the already limited resources of the Sheriff's department and other local and federal patrol efforts and could have negative consequences overall.

Alternative 4

This alternative addresses rangeland health standards that either have not been met or have been identified as a concern in the rangeland health assessments and evaluation reports. Actions such as reducing the number of animals or active use AUMs and requiring either a year-long rest or deferment of grazing on some or all of the pastures are intended to reduce disruption to sensitive plant and wildlife species, reduce impacts on riparian areas and provide more time for plants to recover during the critical growing period. Changes outlined in the allotment-specific sideboards could lead to the herd being moved to other grazing land or back to the ranch in order to meet the criteria; the costs for other grazing land and feed on the ranch are outlined in Alternative 3 above. Specific socioeconomic impacts that may result from these actions are discussed in the individual allotment sections below, based on the requirements outlined for each allotment.

Alternative 5

This alternative would cancel all permitted use AUMs on the allotment for a period of 10 years, after which applications for grazing permits would be accepted. This would likely have a substantial socioeconomic impact on the ranch operators, the people they employ, the businesses where the operators purchase supplies, and the communities that are supported by livestock operation activities. The ranchers would have to relocate their livestock to other private or state land, possibly outside of Owyhee County, sell their livestock, and/or close the ranch completely. The ranchers already likely purchase supplies from stores closer to the new grazing locations, so income from taxes and sales in these communities would drop, and the income from the livestock sales would go to the counties where the base ranches are located. The people previously employed by the ranches would have to look for new jobs if any of the ranches closed; the agricultural sector in all three counties is large enough that they may not have much trouble finding similar work elsewhere, but they may have to relocate or commute long distances, which could be costly. Finding work in other sectors, especially in Owyhee and Malheur counties, may be difficult because unemployment is so high. The greatest loss to the local communities as a result of ranch closures would be the loss of social cohesion. As noted above, researchers have found that ranchers have more social networks throughout the community, and closing a ranch can lead to a disruption in these networks.

However, not all socioeconomic impacts could be negative. Land on the allotments could be more available for recreational opportunities, which could bring more money to the stores, restaurants, and hotels that provide goods and services for people from the Treasure Valley who come to hunt, fish, camp, boat, and watch wildlife throughout the Owyhee Mountains. This could also provide more employment opportunities in other sectors throughout the county. However, as noted in the ORMP EIS (USDI BLM, 1999b), the number of businesses that provide recreational goods and services in Owyhee County is minimal. Most residents, as well as those visiting from other counties, purchase their goods outside of

Owyhee County. Thus, although some recreation fees could be collected, the influx of recreation to the county would not add much to the revenue from sales or taxes there and could actually negatively affect the financial resources of the county through additional requests for help in the backcountry.

3.3.1.7 Cultural/Paleontological Resources

The Owyhee River allotment group is located in the geologic region known as the Owyhee Uplands, which stretches from north-central Nevada, through the southwestern corner of Idaho, to the southeastern corner of Oregon. The region is characterized by sagebrush-covered plateaus and narrow, deep canyon bottomlands. Perennial waterways are few, but the landscape has a multitude of ephemeral drainages and pluvial collection points. Aboriginal occupation of the general area dates back several thousands of years. The archaeological record for the Dirty Shame Rockshelter, which is located approximately 65 miles to the west of the allotment group, has revealed continual human use from 9,500 years ago to 400 years ago (Hanes, 1988). Sites in the Camas Creek area, approximately 12 miles to the northeast, date from about 6,000 years ago to 150 years ago (Plew, 2008). The region still holds important cultural significance to the people of the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

During the 1840s, the Oregon Trail allowed thousands of Euroamericans to travel through southwestern Idaho. Settlement of the area began in the mid- to late-19th century, and the proliferation of gold mining in the 1860s created a demand for livestock to feed the growing population of prospectors and to supply other markets (Yensen D. , 1982). Although local mining activities have subsided greatly, the demand for beef is still high. More recently, recreational pastimes such as hunting and backcountry motorized travel have become very popular and bring people to areas previously ignored.

Direct impacts to cultural resources as a result of livestock grazing that may affect artifacts and features include breakage and modification, vertical and horizontal displacement, and toppling and modification of standing objects (Broadhead, 1999) (U.S. Army, 1990). Indirect effects can include biomass reduction that can increase the potential for erosion of the site matrix, looting due to greater visibility from vegetation removal, and soil compaction. The presence and magnitude of these impacts are used to analyze the effects of livestock, if any, to a cultural or paleontological site. Damage or loss of artifacts and features can affect important attributes that qualify a site as potentially eligible for the National Register of Historic Places. Impacts and the effects caused by livestock to sites can be exacerbated by soil composition, soil moisture and animal concentration. Areas of congregation such as wallows, salting locations, troughs, springs, reservoirs and other watering spots tend to realize the largest impacts. Sites at or in close proximity to these areas would be monitored and, if necessary, protective measures would be instigated. Measures can include but are not limited to exclosure fencing, removal or relocation of range improvements, decommissioning of facilities to eliminate animal congregating, removal of natural attractants, suspension of grazing or changes in the seasons of grazing, or other actions deemed suitable by the land manager and in consultation with SHPO to protect the resource. Typically, the greater the dispersion of livestock and other grazing animals across the landscape, the less likely a site will experience any significant effects.

There are no recorded paleontological sites within the Owyhee River allotment group.

Native American Religious Concerns

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation actively maintain their cultural traditions and assert aboriginal rights and/or interests in this area. As Native American traditions and practices are tied to the elements of the natural environment, any impacts to the earth are of concern to the Tribes. The Tribes have been consulted on the renewal of this grazing permit, pursuant to AIRFA and NHPA, and have not raised any cultural resource concerns. There are no known traditional cultural areas within the allotment.

Cumulative effects

Though the CIAA for cultural resources on all of the Group 1 allotments was set at the allotment boundary (see above), BLM also considered cumulative effects to cultural resources at the project level given that this document ultimately considers permit renewals for four allotments. Accordingly, for the purposes of this paragraph, BLM set the CIAA to the entire project area (including the entirety of the Garat, Castlehead-Lambert, Swisher Springs, and Swisher FFR Allotments) and considered the potential additive effects of Alternatives 1 through 5 for the Castlehead-Lambert Allotment to all of the past, present, and reasonably foreseeable future actions affecting cultural resources on all of the allotments. This exercise showed that while BLM expects to see cultural resources improvement across all allotments because of direct and indirect effects of grazing management changes, BLM does not expect to see a measurable cumulative effect to cultural resources, and certainly no effect that approaches significance.

3.4 Castlehead-Lambert Allotment (0634)

3.4.1 Rangeland Vegetation, Including Noxious Weeds and Invasive Plants

3.4.1.1 Affected Environment

A Rangeland Health Assessment (USDI BLM, 2012a) and Determination (Appendix I) were completed for the Castlehead-Lambert allotment in 2012. The Assessment and Evaluation Report identified that the Idaho Standards for Rangeland Health Standard 4 – Native Plant Communities was not being met, but the subsequent Determination did not identify current livestock management practices as a contributing factor. Juniper encroachment and dominance within pastures 1, 2, 3, 5, and 6 that have not burned in the past few decades were found to be the contributing factor to not meeting the Standard in portions of the allotment. Those portions that have burned in the recent past were found to be making progress toward meeting the Standard. Wildfire has not burned significant acreage within pasture 4 in the past few decades, and junipers have not encroached on the tablelands that make up this pasture.

As noted in the Evaluation Report, vegetation communities with a full complement of dominant grasses and shrubs, consistent with the natural variability of the reference site, are not present within the allotment, and a minor component of invasive species is present. As a whole, sagebrush steppe vegetation communities within the allotment exhibit vegetation functional-structural groups that vary from site potential, with an underrepresentation of dominant deep-rooted bunchgrass species for the sites, primarily bluebunch wheatgrass and Idaho fescue, and Sandberg bluegrass, a shallow-rooted native bunchgrass, occurs more often than the minor component described in ecological site descriptions for the reference site. Although native perennial vegetation communities outside those areas dominated by juniper are in a condition depressed from the reference site conditions, they continue to meet Rangeland Health Standard 4 with healthy, productive, and diverse populations of remaining native plants. With the exception of juniper-dominated sites, the current vegetation communities retain an adequate composition of native perennial species to conclude that proper nutrient cycling, hydrologic cycling, and energy flow are provided.

As stated in the Evaluation Report, recorded upland trend that is static or, at best, only slightly upward, indicates that the ORMP management objectives for vegetation may not be met. Livestock management practices are not providing adequate rest or deferment from livestock grazing use during the active growing season in a number of pastures. Recent implementation of annual active growing season use in pasture 4 and frequent active growing season use of pastures 2 and 3 may not provide adequate deferment or rest. A number of sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season and providing at least 2 years of deferment for every year of active growing season use (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012).

Ecological sites and vegetation condition

The vegetation types and ecological sites for public lands within the northern portion of the Owyhee Field Office, including the Castlehead-Lambert allotment, were described in a vegetation inventory and analysis (1977 to 1979) using methodologies described in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980). Table VEGE-2 provides a listing of ecological sites described, a summary of dominant potential vegetation, and acreage for the Castlehead-Lambert allotment (Map ECOL-1). Ecological site potential and succession, as well as an introduction to state-and-transition models for low sagebrush/bunchgrass and big sagebrush/bunchgrass ecological sites, is provided in Appendix M.

Table VEGE-2: Ecological sites mapped for the Castlehead-Lambert allotment

Ecological Site	Dominant Species Expected	Acres [1]	Percent of Allotment
[3] Clayey 12-16” ARARL/FEID	Alkali sagebrush; Idaho fescue	8,895	19
[2 3] Shallow claypan 12-16” ARAR8/FEID	low sagebrush; Idaho fescue-bluebunch wheatgrass	16,300	35
[3] Very shallow stony loam 10-14” ARAR8/POSA-PSSPS	low sagebrush; Sandberg bluegrass-bluebunch wheatgrass	2,823	6
[2] Loamy 11-13” ARTRT/PSSP	Basin big sagebrush; bluebunch wheatgrass	13	<1
[2 3] Loamy 12-16” ARTRT/FEID-PSSPS	Basin big sagebrush; Idaho fescue-bluebunch wheatgrass	2,570	6
[2 3] Loamy 13-16” ARTRV/PSSPS-FEID	mountain big sagebrush; bluebunch wheatgrass-Idaho fescue	9,187	20
Loamy bottom 12-16” ARTRT/LECI4	Basin big sagebrush; basin wildrye	2	<1
[3] Mahogany savanna 16-22” CELE3-SYOR2/FEID-ACHNA	curl-leaf mountain mahogany-mountain snowberry; Idaho fescue-needlegrass	4,359	10
Unclassified		1,898	4
	Total	46,045	100

[1] Acreage includes all ownerships.
[2] Ecological site descriptions identify a state-and-transition model with increasing Sandberg bluegrass resulting from improper grazing management which if continued and with fire can retrogress through phases and could transition to a new grazing resistant state with Sandberg bluegrass and with cheatgrass as the understory dominant. (80 percent of acres within Castlehead-Lambert)
[3] Ecological site descriptions identify a state-and-transition model with potential for juniper encroachment. (77 percent of acres within Castlehead-Lambert)

In addition to mapping ecological sites listed in Table VEGE-1 above, the vegetation inventory for the Owyhee River allotments completed in the late 1970s included the assessment of range condition classes.

Range condition class data are summarized for public land, which includes the Castlehead-Lambert allotment, in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980). These data were updated and ecological condition was reported by allotment in the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement (USDI BLM, 1999b). Ecological condition is based on a similarity index that compares the plant community present to the historic potential natural community for that ecological site. The similarity index to the historic climax plant community is the percentage by weight of annual production of plant species present at the inventoried site. Table VEGE-3 is a summary of ecological condition within the Castlehead-Lambert allotment from representative locations sampled during the vegetation inventory completed in the late 1970s and updated during development of the ORMP (USDI BLM, 1999a).

Table VEGE-3: Ecological condition for public lands in Castlehead-Lambert allotment, reported in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980) and updated in the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement (USDI BLM, 1999b)

Allotment	Ecological Status (Acres / Percent)				Treated Lands [2]
	Early Seral	Mid-Seral	Late Seral	Potential Natural Condition	
Castlehead-Lambert Allotment (0634) [3]	9,167 / 20	34,375 / 75	2,292 / 5	0 / 0	0 / 0

[1] Ecological status is based on a similarity index to a reference community, in most cases the historic climax plant community or potential natural community (BLM Ecological Site Inventory Handbook: 1734-7). A similarity index of 0-25% is early status; A similarity index of 26-50% is mid status; A similarity index of 51-76% is late status; A similarity index of 77-100% is potential natural community.
[2] Treated lands include those where brush control treatments or seedings preclude classification within one of the conditions classes.
[3] Castlehead-Lambert allotment was a portion of Trout Springs allotment (0539) in 1980 when the Owyhee Grazing Environmental Impact Statement Draft was completed. Subsequent to that EIS, Castlehead-Lambert allotment was divided from Trout Springs allotment.

Vegetation production data from the late-1970s inventory indicate that many sagebrush/bunchgrass communities within the Castlehead-Lambert allotment were less productive than the reference sites described in ecological site descriptions. These data reveal that the majority of sites sampled exhibited a reduced dominance by deep-rooted bunchgrasses and a commensurate increase in sagebrush, shallow-rooted grasses, or both[31]. Localized areas may have crossed the threshold to the identified states dominated by Sandberg bluegrass, squirreltail, annual grasses, and annual forbs in the understory, with little or no sagebrush and with root-sprouting shrubs such as rabbitbrush in the shrub layer, as a result of historic improper livestock grazing and/or altered fire return intervals. The vegetation shift away from the reference site plant communities noted for the Castlehead-Lambert allotment likely occurred in the late portion of the 19th century and the early years of the 20th century, a period when public-land livestock grazing was controlled little and stocking rates were high (Vavra, Laycock, & Pieper, 1994) (USDI BLM, 2002).

Additionally, current vegetation in the Castlehead-Lambert allotment, based on mapping done by the Pacific Northwest National Laboratory (PNNL) from 2000/2001 Landsat satellite imagery and updated for vegetation treatments and fire, is shown in Table VEGE-4.

[31] Analysis of production data used for this EA is on file in the Idaho BLM project record and is available to the public upon request

Table VEGE-4: Current vegetation in the Castlehead-Lambert allotment based on PNNL data as updated

Vegetation Cover Type	Acres	Percent of Allotment
Juniper	5,033	11
Mountain big sagebrush	3,281	7
Low sagebrush	13,380	29
Basin/Wyoming big sagebrush	1,500	3
Bunchgrass	19,982	43
Rabbitbrush	893	2
Wet meadow	201	<1
Mountain shrub	1,495	3
Bitterbrush	21	<1
Exotic annuals	16	<1
Aspen	243	1
Total:	**46,046**	**100%**

The differences between potential vegetation mapped in ecological site inventories and the current vegetation identified in PNNL data are indicated by comparing Tables VEGE-2 and VEGE-4. Ecological site and PNNL mapping were completed at different scales and with different vegetation classification systems, so precise comparison of the two tables is not possible, but general differences in plant community structure and composition are apparent between potential vegetation and current vegetation. In general, juniper is currently the dominant component of a large portion of the landscape in the Castlehead-Lambert allotment. Current juniper dominance within some ecological sites can be compared to the limited presence as small inclusions within vegetation communities which, at potential, would support dominant mountain shrubs, mountain big sagebrush, or low sagebrush in the shrub layer, and native perennial bunchgrasses and forbs in the understory (Table VEGE-2). Ecological site descriptions for the Castlehead-Lambert allotment identify that juniper has the potential to invade as much as approximately 77 percent of the allotment acreage. Ecological site descriptions also identify that potential for juniper dominance of the vegetation community is limited to new states in the state-and-transition models for the Very Shallow Stony Loam 10-14” ecological site and the Mahogany Savanna 16-22” ecological site. The new juniper-dominated state results from improper grazing management and the absence of fire and is similar to the Shallow Breaks 14-18” ecological site, a site not mapped within the Castlehead-Lambert allotment, but with the visual aspect of western juniper and a sparse understory of Idaho fescue and Thurber’s needlegrass. The Rangeland Health Assessment and Evaluation Report for the Castlehead-Lambert allotment completed in 2012 (USDI BLM, 2012a) identifies juniper encroachment as a condition that prevents the allotment from meeting the Idaho Standards for Rangeland Health Standard 4 – Native Plant Communities.

In addition to the encroachment by juniper, which can result in the unknown new ecological state with juniper dominance, other past disturbances are evident when comparing the two tables. Past fires and other disturbances are indicated by the presence of exotic annuals, bunchgrass communities lacking a significant shrub component, and the dominance of green rabbitbrush in the current vegetation.

Potential forage production

The potential production of forage species in the Castlehead-Lambert allotment, based on ecological site descriptions listed in site guides (USDA NRCS, 2010) and the proportion of each ecological site represented in the allotment, provides an estimated average annual production of 449 pounds of grass and grass-like species per acre in the normal year. Assuming that the amount of forage necessary to support one AUM is 1,000 pounds and the maximum allowable utilization limit is 50 percent[32], approximately 4.5 acres would be required to support one AUM, assuming all ecological sites in the allotment were at site potential, equal livestock distribution occurred throughout the allotment, and management objectives maximize livestock production. Conservative stocking is a term commonly used by range researchers to define a level of grazing between light and moderate, generally involving about 30 to 40 percent use of forage (Appendix M). With a maximum allowable utilization of 35 percent, approximately 6.4 acres would be required to support one AUM, assuming ecological condition were at reference site conditions and livestock distribution were equal throughout the allotment.

Vegetation inventory data recorded for the Castlehead-Lambert allotment in the late 1970s identify that the ecological condition at many inventoried sites sampled was largely influenced by the presence of shrub species with a reduced dominance by deep-rooted bunchgrass species. Although recent fire has reduced sagebrush and juniper dominance on large portions of the allotment, deep-rooted bunchgrasses have not recovered to site potential (USDI BLM, 2012a). The presence of sagebrush and the greatly reduced occurrence or dominance by native perennial bunchgrass species, the primary forage species supporting authorized levels of livestock grazing, is reflected in the early to mid-ecological condition recorded for the majority of the Castlehead-Lambert allotment. As a result, the lack of the potential co-dominance by native bunchgrass species greatly reduces the production of forage from the allotment as compared to the reference site in ecological site descriptions (USDA NRCS, 2010). In addition, livestock do not equally distribute grazing use throughout any pasture, resulting in areas of lighter use and areas of heavier use.

Conclusion

To summarize, the Castlehead-Lambert allotment is not meeting the Standard for Native Plant Communities (Standard 4) because juniper encroachment into vegetation communities that should not include juniper (in excess of a few scattered trees) is competing with native perennial shrub, bunchgrass, and forb species. Altered fire frequency from natural disturbance regimes contribute to conditions that lead to a failure to meet the standard due to juniper encroachment. Remnant native perennial vegetation in portions of the allotment not dominated by juniper encroachment continue to support proper nutrient cycling, hydrologic cycling, and energy flow adequate to meet Standard 4, even though vegetation communities have shifted to a greater dominance of shallow-rooted native perennial bunchgrass species and non-native annuals and a decline in larger deep-rooted native perennial bunchgrasses.

Although current livestock management actions were not identified as activities that led to the failure to meet Standard 4 within the allotment, they do contribute to concerns for meeting the ORMP management objective for vegetation. The management objective for vegetation identified in the ORMP is to improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas. The vegetation communities within the allotment were primarily in an early to mid-ecological condition at the time the ORMP was adopted (1999), and only 5 percent of the allotment was in late ecological status. The 2012 Rangeland Health Assessment and Evaluation Report for this allotment (USDI BLM, 2012a) and the Determination (Appendix I) identified a general short- and long-term static trend in the frequency of desirable native bunchgrass species (bluebunch wheatgrass, Idaho fescue, and Thurber's needlegrass). That static trend indicates an ecological condition depressed from the identified reference conditions for all ecological sites or desired to meet the ORMP vegetation objective. Although that depressed ecological condition was found to be largely a product of grazing management practices in the late 1800s and early years of the 20th century (National Research Council, 1994), as well as a product of extended fire return intervals resulting in the encroachment by juniper trees into sagebrush steppe vegetation communities

[32] A management action listed in the ORMP to meet the livestock grazing management objective is to limit upland forage utilization by livestock on key herbaceous forage species to 50 percent unless a higher or lower level of use is appropriate to meet standards for rangeland health.

(Appendix I), the recent trend in frequency of desirable native perennial bunchgrasses does not indicate progress toward improved ecological conditions.

State-and-transition models for big sagebrush and low sagebrush/bunchgrass vegetation communities within the allotment indicate the possibility of restoring desirable perennial bunchgrass health and vigor with implementation of proper livestock grazing management practices. The potential to restore desirable perennial bunchgrass health and vigor are present when past actions have not resulted in a transition to a new and less productive state (USDA NRCS, 2010). State-and-transition models identify that changes from current livestock management practices would improve native perennial species composition and function, including the restoration of dominance by large deep-rooted perennial bunchgrass species. Those models identify the grazing tolerant phase dominated by shallow-rooted native bunchgrasses as a community that has not crossed the transition to a different state. Passive management through implementing proper grazing management practices that support maintenance and recovery of large deep-rooted perennial bunchgrasses would help achieve ORMP objectives to improve unsatisfactory and maintain satisfactory vegetation condition.

Weeds

In Idaho, the BLM works closely with the Idaho Department of Agriculture, Tribal governments, and county governments to combat noxious weeds. Cooperative weed management arrangements utilize local, state and Federal resources to inventory and treat weed infestations on both public and private lands. Populations are recorded, treated, monitored, and retreated as their presence is known. Undiscovered noxious weeds may also exist. Identified locations of weeds within the Castlehead-Lambert allotment are limited to isolated sites of Canada thistle and whitetop along roads. Adjoining allotments also have identified sites of Russian knapweed and whitetop along roads. Noxious weed control is ongoing in this area.

Invasive annual species, including cheatgrass and a number of nonnative annual forbs, are present in the Castlehead-Lambert allotment, as noted in the 2012 Evaluation Report (USDI BLM, 2012a), but they don't dominate in any areas. Livestock grazing is one of a number of vectors for the introduction of noxious weeds and invasive species to public lands and increasing the spread of existing incursions. Livestock may spread weeds and invasive species through transport on fur and on hoofs, as well as through ingestion and later defecation of viable seeds. This transport can occur from sources used prior to scheduled use of public land, between sites within the allotment, or to locations outside the allotment at the end of the grazing season. Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel provides sites for establishment of weeds and invasive species.

3.4.1.2 Direct and Indirect Effects

Analyses of the Current Situation alternative, the applicants' proposed action, and Alternatives 3 through 5 are based on consequences of seasons and intensities of livestock grazing use provided in earlier sections of the EA and Appendix M, including the vegetation Affected Environment section for the Owyhee River group of allotments (Rangeland Vegetation Section 3.3.1.1) and the vegetation Affected Environment section for the Castlehead-Lambert allotment (Rangeland Vegetation Section 3.4.1.1). In addition, Appendix M provides ecological concepts for expected vegetation change resulting from livestock management practices.

3.4.1.2.1 Alternative 1 Effects

Implementation of Alternative 1 would continue current livestock management actions, only differing from terms and conditions of current permits with a small reduction of livestock numbers and the resulting reduction of active AUMs authorized. Impacts to health and vigor of native perennial bunchgrasses, preferred forage plant species, would occur with scheduled growing season use in 2 consecutive years of each 3-year period. Opportunity for recovery from growing season impacts would be limited to 1 year of rest from livestock grazing in each 3-year period in most pastures. The light to moderate utilization of key forage plants documented with recent management, trending toward light utilization with increased herbaceous production after the 2007 Crutcher Crossing fire, would be expected to continue (See Appendix B). This level of utilization would not be expected to contribute toward failure to meet Standard 4 but would continue to limit improvement in upland condition and trend, as noted in the 2012 evaluation report (USDI BLM, 2012a). Continued utilization levels that have occurred in recent years, primarily during the active growing season, would limit improvement in upland condition and trend.

Seasons of grazing use

Livestock grazing results in selective removal of more palatable plants and portions of plants. As identified in Appendix M, active growing season use has a greater potential to impact vigor and health of bunchgrass species as compared to use during periods outside the active growing season. The pasture rotation scheduled under Alternative 1, with 2 consecutive years of growing season use within pastures 2, 3, and 4, followed by 1 full year of rest from livestock grazing, would result in more palatable bunchgrass species, primarily bluebunch wheatgrass, being repeatedly defoliated during the active growing season and not able to fully recover health and vigor impacted by the reduction in photosynthetic capacity. Frequent growing season removal of plant material, with limited rest to allow recovery, would also limit seed production, regeneration, and establishment of new individuals in vegetation communities. The scheduled 1 year of rest in every 3-year period would allow some recovery of health and vigor by allowing native perennial species to complete a growth cycle without livestock grazing use. Removal of photosynthetic material during the active growing season requires the plant to replace leaf surface and tillers, the active photosynthetic plant parts. Continuation of flexibility in the grazing schedule recently implemented would result in additional active growing season use in these pastures (Appendix B), further impairing perennial bunchgrass health and vigor.

Use of pasture 5, in conjunction with cattle use in pasture 3 and with flexibility to graze domestic horses season-long, would allow annual active growing season use resulting in greater impairment of health and vigor of perennial bunchgrass as compared to those impacts identified for pasture 3.

Annual grazing use of pastures 1 and 6 (combined) between July 8 and September 30 would defer use to a period outside the active growing season annually and allow full expression of growth and vigor with opportunity for regeneration and development of new individuals in vegetation communities. Perennial bunchgrass plants would not be defoliated by livestock grazing during the active growing season, nor would growing tillers have growth points removed. Perennial forbs would complete the annual growth cycle in the absence of livestock grazing. Healthy biotic populations and communities in these pastures would be maintained and improved.

Intensity of grazing use

Recorded utilization levels at stocking rates under existing permits have been within the light (21 to 40 percent) and moderate (41 to 60 percent) categories, with limited exceptions. In addition, recorded utilization has been consistently less than the moderate category, following the 2007 Crutcher Crossing fire and subsequent increase in herbaceous production. The scheduled grazing use and livestock numbers identified in Alternative 1 would result in approximately 15.6 public land acres in the Castlehead-Lambert allotment used to support one AUM, including the acreage from scheduled rest of pastures in the rotation. The number of acres to support one AUM within individual pastures of the allotment scheduled through the 6-year rotation of Alternative 1 is greatest, at 19.3 acres, in pasture 4 during all years of the pasture rotations and the least, at 8.2 acres, in pastures 1 and 6 in all years (Appendix D). The small change from past stocking rates, resulting from 9 percent fewer AUMs authorized in Alternative 1 as compared to current permits, is expected to result in somewhat reduced utilization levels and negative impacts to vegetation resources, especially when grazing occurs after the active growing season. The continuation of current grazing practices, with the number of livestock authorized to graze within the allotment unchanged from recent actual use, is expected to result in levels of utilization consistent with recent recorded utilization levels, all less than the moderate category and generally consistent with conservative stocking that results in the 30 to 40 percent level that is often recommended by range researchers (Appendix B) (Appendix M).

Juniper encroachment

Livestock grazing seasons of use and livestock numbers authorized in the Castlehead-Lambert allotment with implementation of Alternative 1 would not contribute to either improvement or continued failure to meet the Idaho Rangeland Health Standard for native plant communities in areas where the standard is not being met due to juniper encroachment into sagebrush steppe vegetation communities. Other than the indirect effect from removal of fine fuels that support the spread of wildfire, recent livestock grazing has had little influence on juniper encroachment. Although browsing by goats has been found to be an effective tool to reduce juniper encroachment when the trees are young, juniper foliage is laden with monoterpenes that reduce digestibility and can cause liver damage in other livestock (Taylor, Jr., 2006). The introduction of season-long grazing by large numbers of domestic livestock beginning in the late 1800s, a period of uncontrolled livestock grazing (National Research Council, 1994), reduced fine fuels and significantly reduced the frequency, extent, and effect of naturally occurring fire (Oregon Watershed Enhancement Board, 2007). Miller and others identified that the peak of juniper establishment in closed canopy woodland stands in southeastern Oregon and southwestern Idaho was between 1890 and 1920 (Oregon State University Agricultural Experiment Station, 2005). Closed canopy stands produce limited shrub and herbaceous biomass, even in the absence of livestock grazing.

Weeds

Alternative 1 also includes the continued risk of introducing noxious weeds and invasive species to public lands and potential for spread of existing incursions. Although the presence of cheatgrass and other invasive annual species was identified in the 2012 Rangeland Health Assessment and Evaluation Report for this allotment (USDI BLM, 2012a), no location within the allotment was found to be dominated by these species.

Livestock may spread weeds and invasive species through transport on fur and on hoofs, as well as through ingestion and later defecation of viable seeds. This transport can occur from sources used prior to scheduled use of public land, between sites within the allotment, or to locations outside the allotment at the end of the grazing season. Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel provides sites for establishment of weeds and invasive species. The level of risk associated with implementation of Alternative 1 is proportional to the number of livestock authorized to graze within the allotment and the concentration of soil disturbance. Alternative 1, authorization of annual grazing use of 2,945 AUMs, would result in risk for introduction of weeds and spread of existing weeds nearly equivalent to that risk with implementation of the performance-based alternative (annual grazing authorization for 3,244 AUMs) and the season-based alternative (annual grazing authorization for 2,101 AUMs) because authorized levels of use would be similar. Risks of weed and invasive species introduction and spread would be greater, with significantly higher stocking rates in the applicants proposed action (annual grazing authorization for 4,278 AUMs), while those risks would be eliminated in the no-grazing alternative.

Conclusion

Although the Idaho Rangeland Health Standard for native plant communities would likely continue to be met in portions of the allotment not dominated by juniper with implementation of Alternative 1, progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would not result. The condition of native perennial vegetation of pastures 2, 3, and 4, grazed frequently during the active growing season, would not improve and would result in the majority of the allotment remaining in early to mid-ecological condition. When livestock management actions under Alternative 1 are considered against the grazing response index suggested by Reed and others (1999), the combined likelihood for frequent grazing use during the growing season (more than three times) with no chance for regrowth following scheduled grazing use in 2 of 3 years of the grazing schedule would be harmful. The ORMP management objective to improve unsatisfactory vegetation health/condition would not be met, with more than 10 percent of the allotment in early condition and less than 40 percent in late or potential natural condition. In the absence of actions to reduce stressors to biotic function induced by livestock management practices, downward trend would be anticipated as a result of stressors induced by climate change, primarily altered precipitation and temperature regimes, and exacerbated by livestock management practices as identified above. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

3.4.1.2.2 Alternative 2 Effects

Livestock management practices identified under Alternative 1 provide conditions that continue to meet rangeland health Standard 4 but would not meet the ORMP management objective for vegetation. However, the combined increase in the level of livestock use proposed in Alternative 2 with scheduled seasons of grazing use for pastures 2, 3, and 4 would place the allotment at risk for failing to meet both Standard 4 and the ORMP management objective for vegetation. Implementation of the applicants' proposed action would result in an increase of active grazing use (allotment-wide stocking rate) by 42 percent when compared to Alternative 1. The proposed grazing schedule under Alternative 2 has similarities to the Alternative 1 schedule, with opportunity to limit growing season use to alternate years, as opposed to growing season use in 2 of 3 years and rest in the third year. Although the flexibility provided in the grazing schedule can provide opportunity for alternate-year deferment of grazing until after the active growing season and allow recovery of plant vigor and health, that same flexibility also provides opportunity to graze livestock during some portion of the active growing season every year in pastures 2, 3, and 4.

Seasons of grazing use

Pasture 4 would be grazed early in the active growing season for 30 to 50 days each year. Flexibility in the schedule provides opportunity to delay initiation of grazing for up to 15 days due to climatic conditions, resulting in use beginning between April 15 and April 30. That flexibility also would allow the ending date for grazing in the pasture to vary in any year between May 14 and June 17 (Appendix H). Whereas mid-May removal of cattle from the pasture would provide a large portion of the active growing season (May1 – July 1) for regrowth and recovery of perennial plants following removal of livestock, later removal from the pasture on an annual basis would limit recovery and, over the term of the permit, result in declining native perennial bunchgrass condition and trend (Appendix M). Flexibility provided by this schedule could provide for conservative early-on and early-off grazing. In years with average or greater precipitation and effective soil moisture or with the earlier dates of livestock removal from the pasture, opportunity would be provided for regrowth up to or equal to annual production that would have occurred in the absence of grazing. In years of limited precipitation or extension of the period of use to the later dates, grazing use could continue through the major portion of the active growing season and could defoliate preferred bunchgrass species repetitively at a time of reduced soil moisture needed for regrowth. The ability of desirable perennial bunchgrass species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be reduced. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be impaired in years with limited soil moisture. As compared to a more conservative grazing treatment in Alternative 1 that scheduled year-long rest every third year, alternative 2 provides flexibility that could result in annual grazing use during the majority of the active growing season in pasture 4, resulting in declining native perennial plant health and condition. At a minimum, the grazing schedule under Alternative 2 for pasture 4 would allow for some grazing use during a portion of the active growing season annually and continue the static to downward vegetation trend in pasture 4 recorded in the 2012 Castlehead-Lambert allotment evaluation report (USDI BLM, 2012a).

The grazing schedule for pastures 2 and 3 would allow grazing use under a 2-year cycle. The first year of the cycle would schedule grazing through the majority of the active growing season for upland perennial species. The second year of the 2-year cycle would allow grazing during the latter portion of the active growing season and extending into the period of bunchgrass dormancy. With flexibility provided in the schedule, grazing use of these two pastures could be deferred until after the active growing season (July 1) in alternate years. That same flexibility could allow grazing in the first year of the cycle through the active growing season and use in the second year of the cycle through the last half of the active growing season which includes the boot and flowering stages of growth for bunchgrass species, a period of greatest impact to health and vigor (Appendix H). Whereas deferring grazing use of the second of the two pastures used until after July 1 could allow bunchgrass plants to complete their growth cycle in the absence of livestock grazing in alternate years and thus be provided opportunity to recover health and vigor, annual grazing use through the more critical portion of the active growing season would limit recovery and, over the term of the permit, result in declining native perennial bunchgrass condition and trend (Appendix M). The proposed grazing schedule for pastures 2 and 3 does not meet the recommendation by a number of range specialists that grazing use of bluebunch wheatgrass occur no more than 1 of 3 years during the active growing season (Stoddart, 1946), (Blaisdell & Pechanec, 1949) (Mueggler, 1972), (Mueggler, 1975), (Miller, Seufert, & Haferkamp, 1994), (USDA NRCS, 2012).

Grazing in pastures 1 and 6 would be deferred annually until after the active growing season, similar to the grazing treatment of these pastures in Alternative 1. Annual deferment would allow plants to complete yearly growth cycles and only be grazed while plants are dormant. The absence of grazing by livestock while the plants are actively growing would provide improvement in vigor and health of native perennial species. In years when fall precipitation leads to regrowth of native perennial bunchgrass species, limited grazing of fall growth would not impair opportunity for completion of the annual growth cycle in the following year. Bunchgrass vigor and health would be maintained because available soil moisture in the following spring would support completion of the annual growth cycle.

Discretionary cattle grazing use in pasture 5 would be limited to approximately 150 to 200 AUMs within undefined seasons. Opportunities to meet or fail rangeland health standards for native plant communities and the ORMP objective for vegetation would be dependent on the intensity of livestock management provided. Similarly, discretionary domestic horse grazing use in pasture 5 would be limited to approximately 56 AUMs within undefined seasons. Analysis of livestock management practices, which could contribute to meeting or failing to meet standards or objectives, cannot be determined with the flexibility in seasons of use proposed.

Intensity of grazing use

As compared to Alternative 1, Alternative 2 would result in stocking rates for all pastures with fewer acres per AUM. This alternative would include stocking individual pastures at a rate of between 9.4 and 11.7 acres per AUM (Appendix D), a stocking rate allotment-wide that would not be sustainable given the current ecological status of the allotment and the amount of forage that the allotment current produces. Anticipated utilization levels resulting from the proposed 42 percent increase in authorized active grazing use under Alternative 2 would be greater than the light-to-moderate utilization levels recorded in recent years and likely to continue under Alternative 1. Utilization levels would periodically reach or exceed the maximum allowable limit of 50 percent established in the ORMP to meet vegetation management objectives or the moderate level of forage species utilization that allows for maintenance of palatable species but usually does not permit an improvement in herbage-producing ability (Appendix M). At a minimum, the increase in authorized active grazing use would result in the recorded utilization in some pastures periodically exceeding the conservative stocking rate that results in the 30 to 40 percent utilization level that is recommended by a number of range researchers (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012). As a result, the ecological status and health of native upland vegetation communities would not be expected to improve, due to the proposed increased stocking rate and resulting moderate or greater utilization levels, especially when grazing use occurs frequently during the active growing season.

Juniper encroachment

For the reasons noted in the analysis of Alternative 1, implementation of Alternative 2 would not contribute to either improvement or continued failure to meet the Idaho Rangeland Health Standard for native plant communities where that standard was not being met due to juniper encroachment into sagebrush steppe vegetation communities.

Weeds

The grazing schedule in the applicants' proposed action will contribute to the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions as identified in Alternative 1. That risk will increase with 42 percent more livestock on the allotment, due to greater soil surface disturbance and more animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

Under the applicants' proposed action, more frequent use during the active growing season would occur than the grazing scheduled under Alternative 1. Although flexibility in the grazing schedule may allow alternate-year deferment of grazing use in pastures 2, 3, and 4 until after the active growing season for native perennial bunchgrasses, that same flexibility also allows grazing every year during a portion of the active growing season. At its limits, that flexibility would allow grazing annually during the boot stage of seed development, when the seedhead is enclosed within the sheath of the flag leaf. This is a period of use found to impact bunchgrass plants the most (Anderson L. D., 1991) (Ganskopp, 1988).

Alternative 2 with its planned rest from grazing for a full year in 1 of 3 years, would have more frequent growing season use, compared to Alternative 1, that would limit recovery of deep-rooted perennial bunchgrasses and would also increase the intensity of grazing use to levels near or exceeding those set as a maximum to meet ORMP vegetation objectives.

In addition to those portions of the Castlehead-Lambert allotment not meeting Standard 4 due to juniper encroachment, livestock management practices proposed in Alternative 2 would place much of the allotment at risk of failing to meet both Standard 4 and the ORMP management objective for vegetation over the long term. This likelihood of failing to meet Standard 4 and the ORMP vegetation objectives would be greatest with misuse of flexibility provided in the grazing schedule. When livestock management actions under the applicants' proposed action are considered against the grazing response index suggested by Reed and others (1999), the likelihood for frequent removal of photosynthetic material during the growing season (more than three times) and limited chance for growth or regrowth in the absence of livestock grazing combine in pastures 2, 3, and 4 indicate that planned management would be harmful. Progress toward a full complement of native perennial species, consistent with the potential identified by the reference site in the ecological site description, would not result. The condition of pastures 2, 3, 4, and 5 would not improve when flexibility to graze frequently during the active growing season is provided; this would lead to the majority of the allotment remaining in early to mid-ecological condition. The ORMP management objective to improve unsatisfactory vegetation health/condition would not be met, with limited likelihood of improvement from more than 10 percent of the allotment in early condition and less than 40 percent in late or potential natural condition. The increase to stressors to biotic function induced by livestock management practices, less scheduled rest and increased livestock numbers as compared to Alternative 1, would result in an anticipated downward trend when added to additional stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

3.4.1.2.3 Alternative 3 Effects

Although the performance-based alternative has the same season of use, livestock number, and AUM terms and conditions as Alternative 1, Alternative 3 also includes performance-based terms and conditions that limit the intensity of grazing use on upland vegetation, riparian resources, and special status species habitats. These performance-based terms and conditions would provide substantial improvement to native plant communities under this alternative when compared to current conditions. Though Alternative 3 does include a 7 percent increase in active use when compared to Alternative 1, the stocking rate for the allotment would be equal to stocking rates identified in current permits to graze livestock in the allotment, and BLM determined that those stocking rates are not necessarily inconsistent with plant health. Additionally, the performance-based terms and conditions (terms and conditions 12 through 14 on the permit) are intended to protect and enhance native plant communities.

Under Alternative 3, the limits in growing season utilization in upland vegetation communities, riparian grazing use, and grazing use in sage-grouse habitat would improve upland vegetation and native plant communities because the intensity of grazing use during the active growing season would be reduced and native perennial species would be allowed to complete the annual growth cycle with limited need to replace photosynthetic surface area midway through the growing season. This utilization limit (≤20 percent) would require more intensive livestock management practices to distribute livestock and associated grazing impacts more evenly throughout each pasture. If a greater dispersal of livestock does not occur, location-specific and permittee-initiated reductions in livestock use would be required, which would result in reduced impacts to vegetation resources from grazing and trampling, especially during the active growing season. Limitations on growing season utilization would allow the Idaho Rangeland Health Standard for native plant communities and the ORMP vegetation management objective to be met long-term.

Seasons of grazing use

The grazing schedule identified under Alternative 1 would also be implemented under Alternative 3. The analysis of consequences to vegetation resources of implementing the seasons of use for each pasture of the allotment are presented for Alternative1 above. Some sources (Holechek, Gomez, Molinar, & Galt, 1999) (Holechek, Thomas, Molinar, & Galt, 1999) identify the benefits of limiting stocking rates or utilization levels to allow grass species recovery and maintenance of health and vigor, rather than defining seasons of grazing use (such as the recommendation that grazing of bluebunch wheatgrass be limited to no more than 1 in 3 years during the active growing season). Impacts from seasons of use under Alternative 3 would be similar to those identified for Alternative 1, although the combined effect of seasons and intensities of grazing use would differ as discussed below and in Appendix M.

Intensities of grazing use

The initial stocking rate for individual pastures of the allotment would be between 7.5 and 17.2 acres per AUM, slightly less than the stocking rate in Alternative 1, as a result of the 7 percent greater authorized active use. At these stocking rates and in the absence of changes to livestock management practices, utilization levels would be expected to exceed the 20 percent maximum allowable performance-based term and condition in pastures used during the active growing seasons. This conclusion is reached because recorded utilization of key species in pastures used during the active growing season in recent years has repeatedly exceeded 20 percent, as summarized in Table VEGE-5.

Table-VEGE-5: Recorded utilization of bluebunch wheatgrass and Idaho fescue in pastures grazed during the active growing season (5/1 to 7/1)

Pasture	Year	Reported use dates	Recorded Utilization	
			Bluebunch Wheatgrass	Idaho Fescue
#2 Carter Springs	1993	6/10 to 7/25		40
	1994	6/13 to 7/3	40	30
	1996	6/12 to 8/3		66
	1997	4/15 to 6/5		37
	2010	4/17 to 5/21		5
#3 Red Basin	1994	4/15 to 6/15	36	35
	1995	6/15 to 8/4	39	37
	1997	6/2 to 8/3	56	63
	2010	6/27 to 8/18	13	35
#4 Lambert Table	1993	4/15 to 6/25		35
	1995	4/15 to 6/19		16
	1996	4/15 to 6/14		32
	2010	5/21 to 6/27	6	10
	2011	5/22 to 7/23		3

Increased intensity of livestock management practices to retain utilization levels below the threshold of the performance-based term and condition during the active growing season would ensure that plants are used at a slight or lower level (≤20 percent). The reduction in growing season utilization levels from current levels (Table VEGE-5) to less than 20 percent equates to removal of a smaller portion of photosynthetically active leaf surface area and removal of fewer tillers. Limitation of the utilization level during the active growing season would reduce the need for native bunchgrasses to replace leaf material removed during the active growing season and the initiation of new tiller development midway through the active growing season to replace tillers with growth points removed during grazing. Interruption of photosynthetic capacity during the active growing season would be lower than under higher utilization levels of Alternative 1. Limiting utilization to less than 20 percent would reduce the number of plants grazed during the boot stage, the more critical portion of the active growing season. As a result of reduced active growing season utilization levels, health and vigor and recovery of deep-rooted bunchgrass plants would be expected in pastures 2, 3, and 4, all scheduled to be grazed during the active growing season 2 of every 3 years. Year-long rest scheduled 1 of every 3 years would additionally benefit the recovery of ecological status and health of native upland vegetation communities, as identified in Alternative 1.

Retention of the maximum allowable utilization limit of 50 percent for key species during periods outside the active growing season would retain standing senescent plant material and litter to protect soils from erosion and also protect soil properties, indirectly benefiting native perennial vegetation health and vigor.

Compliance with performance-based terms and conditions for riparian resources and special status species habitat would also result in lower intensities of use of native perennial species. These terms and conditions may often limit grazing use in pastures where these resources are present before maximum allowable utilization limits are reached. However, with these terms and conditions and utilization limits, the ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber’s needlegrass) to compete with other less desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be improved in years with limited soil moisture.

Juniper encroachment

For the reasons noted in the analysis of Alternative 1, implementation of Alternative 3 would not contribute to either improvement or continued failure to meet the Idaho Rangeland Health Standard for native plant communities where that standard was not being met due to juniper encroachment into sagebrush steppe vegetation communities.

Weeds

The grazing schedule in Alternative 3 will contribute to the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions, as identified in Alternative 1. With livestock numbers increased by 7 percent, that risk is slightly increased due to greater soil surface disturbance and more animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

The Idaho Rangeland Health Standard for native plant communities would continue to be met with implementation of the performance-based alternative in portions of the allotment not dominated by juniper. The condition of pastures 2, 3, and 4, with limitations to utilization during the active growing season, would lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result in the long term (the 10-year term of the permit). In the event that the growing season utilization limit was periodically exceeded over the 10-year term of the permit, but less often than the trigger of 2 in any consecutive 5-year period, static trend, as documented in the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012a), may occur in the short term (1 year or less). However, as long as livestock management practices are implemented to meet the performance-based terms and conditions, native plant communities would improve in health and vigor over the life of the permit.

When livestock management actions under Alternative 3 are considered against the grazing response index suggested by Reed and others (1999), the intensity of grazing use would be low, suggesting less harmful impacts to plant health than under Alternative 1 or Alternative 2. However, the opportunity for frequent livestock removal of some photosynthetic material during the growing season (more than three times) and limited chance for regrowth following scheduled grazing use, combined in 2 of 3 years of the grazing schedule, suggest a greater likelihood of impacts to plant health that would occurred under Alternative 4. The ORMP management objective to improve unsatisfactory vegetation health/condition would be met with improvement toward less than 10 percent of the allotment in early condition and more than 40 percent in late or potential natural condition. The reduction of stressors to biotic function induced by livestock management practices resulting from the performance-based terms and conditions, primarily limiting growing season utilization levels, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.4.1.2.4 Alternative 4 Effects

Implementation of the season-based alternative would implement a pasture rotation schedule that includes less frequent use during the critical growth period for pastures 2, 3, and 4, when compared to the other grazing alternatives. Alternative 4 would implement periodic deferment of grazing use to a period outside the active growing season more often than would occur with implementation of any of the other grazing alternatives. The decrease in the frequency of growing season use would allow native perennial species to complete the annual growth cycle more often in the absence of removal of photosynthetic material by livestock grazing, allowing recovery of plant health and vigor. Additionally, Alternative 4 would result in a decrease of active grazing use by 30 percent when compared to Alternative 1. It achieves this decrease in active grazing use by reducing livestock numbers. Whereas livestock management practices identified under Alternative 1 were found to continue to meet Rangeland Health Standard 4 but would not meet the ORMP management objective for vegetation, the combined grazing schedule with less frequent active growing season use and reduced level of livestock use proposed in Alternative 4 would improve rangeland health to better ensure that Standard 4 and the ORMP management objective for vegetation are met over the term of the permit.

Seasons of grazing use

The grazing schedule identified under the season-based alternative would implement a scheduled 2-year rotation through pastures that would limit grazing use to 1 in 2 years during the active growing season (May 1 to July 1) in pastures 1, 2, and 6. Similarly, the grazing schedule would implement annual deferment of grazing use to a period after the active growing season in all years for pastures 3 and 4, but with flexibility to graze in alternate years late in the growing season. As identified in Appendix M, active growing season use has a greater potential to impact health and vigor of bunchgrass species as compared to use during periods outside the active growing season. The pasture rotation scheduled under Alternative 4, with deferment of grazing use in pastures 1, 2, 3, 4, and 6 until after the active growing season in alternate years or more frequently, would result in palatable bunchgrass species, primarily bluebunch wheatgrass, being allowed to complete the annual growth cycle more often in the absence of partial defoliation from livestock grazing. The alternate-year absence of paretial defoliation by livestock allows plants to continue their growth cycle without needing to replace grazed leaf material or tillers midway through the growing season.

Restrictions on the season of grazing use of pasture 2 to meet riparian management objectives limits its use to spring only. Although annual use of pasture 2, when cattle are turned out on the allotment (April 15), is during a period when native perennial species are initiating growth, removal of cattle by April 30 in 1 of 2 years provides for an early-on and early-off grazing treatment that allows plants to regrow through the active growing season (May 1 to July 1) and complete their annual growth cycle. Removal of cattle from pasture 2 by May 31 in the other year of the 2-year cycle also provides some opportunity for regrowth before the end of the active growing season (July 1).

Although scheduled grazing in pasture 5 would allow annual grazing during the active growing season to move cattle between pastures, flexibility in the use of this transition pasture would be limited to no more than 7 days of grazing. Reed (1999) used 7 to 10 days as the average period before cattle return to graze grass plants used earlier. Because livestock do not graze an entire plant at any one time, and one aspect of the intensity and duration of grazing is the frequency of partial defoliation during plant growth, native perennial bunchgrasses in pasture 5 would receive grazing use similar to that discussed in Alternative 3, with a maximum allowable utilization of 20 percent. Native perennial bunchgrass health and vigor would improve under the grazing treatment scheduled because the duration of grazing use during the active growing season would be limited.

Intensity of grazing use

As a result of implementing restrictions to seasons of grazing use for pastures based on resources present within each pasture, Alternative 4 would result in a decrease of active grazing use by 30 percent when compared to Alternative 1. This reduction is largely due to the need to manage grazing during the seasons of use appropriate for meeting riparian objectives and the presence of riparian resources that would be managed with these restricted seasons. Pasture 2 also has season-of-use restrictions to provide habitat for special status wildlife species. Stocking rates for pastures 1 and 6 would vary through the grazing rotation between 10.1 and 40.1 acres per AUM under Alternative 4, as compared to 8.2 acres per AUM under Alternative 1. Similarly, the stocking rates for pasture 2 through the grazing rotation would be 16.2 and

47.4 acres per AUM in years 1 and 2, respectively, under Alternative 4, as compared to 11.1 acres per AUM under Alternative 1. As a result, utilization levels in these pastures would be reduced proportionally from those under Alternative 1 presented above and those recorded in recent years.

Livestock water in pasture 4 is limited to stock water ponds that are unreliable sources of water into mid-summer, so grazing use is limited to the spring and the grazing schedule does not require grazing use in pasture 4. As a result, average utilization levels in pasture 4 would be expected to be lower under Alternative 4 than under Alternative 1. Reduced utilization levels would benefit health and vigor of perennial bunchgrass plants.

The pastures least restricted by resource-based seasonal limitations – pasture 3 in all years and pasture 6 in year 2 of the schedule – would continue to be stocked at rates similar to those in Alternative 1, resulting in utilization levels and effects to vegetation resources similar to those identified in Alternative 1. Health and vigor of perennial bunchgrass plants in these pastures would be maintained as identified under Alternative 1.

Reduced utilization within most pastures of the allotment, as described above, as well as the overall reduction in livestock numbers and authorized active use, would result in improved health and vigor of native perennial species as compared to Alternative 1. When combined with the seasons of grazing use that are more appropriate for maintaining and improving biotic health of plant communities in the sagebrush steppe vegetation communities (described above), Alternative 4 would result in greater opportunity for improved health and vigor of native perennial species as compared to Alternative 1 and Alternative 2. Opportunity to maintain or improve health and vigor of native perennial species would be similar to Alternative 3.

The ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be improved in years with limited soil moisture.

Juniper encroachment

For the reasons noted in the analysis of Alternative 1, implementation of Alternative 4 would not contribute to either improvement toward or continued failure to meet the Idaho Rangeland Health Standard for native plant communities where that standard was not being met due to juniper encroachment into sagebrush steppe vegetation communities.

Weeds

The grazing schedule in Alternative 4 will contribute to the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions, as identified in Alternative 1. With livestock numbers reduced by 30 percent, that risk is proportionally reduced due to less soil surface disturbance and fewer animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use to meet resource objectives and its reduction in livestock grazing use, would result in improved native perennial plant health and vigor. When livestock management actions under Alternative 4 are considered against the grazing response index suggested by Reed and others (1999), the likelihood for frequent livestock grazing during the growing season (more than three times) and no chance for regrowth following scheduled grazing use would be limited to 1 in 2 years, whereas the utilization level during the growing season would be light during that 1 year. This would result in the benefits to vegetation resources from livestock management practices similar to actions under Alternative 3, which are the least harmful to plant health of the grazing alternatives considered. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result in the long term (the 10-year term of the permit). The ORMP management objective to improve unsatisfactory vegetation health/condition would be met with improvement toward less than 10 percent of the allotment in early condition and more than 40 percent in late or potential natural condition. The reduction of stressors to biotic function induced by livestock management practices, primarily limiting the frequency of growing season use and reducing livestock numbers, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.4.1.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would provide a rate of recovery toward ecological site potential more rapid than other alternatives considered. In the absence of livestock grazing, growing season removal of photosynthetic material of native perennial species, including bunchgrass species that provide the majority of current forage for livestock grazing use, would be limited to use by native herbivores, including insects. Limited growing season impacts to the photosynthetic capacity would allow bunchgrass species to complete their growth cycle annually without the need to replace grazed leaf material or grazed tillers midway through the growing season, and would thus regain health and vigor. Although restoration of vegetation communities consistent with the reference site described in ecological site descriptions is limited to a process which may take multiple decades, if not centuries (Vavra, Laycock, & Pieper, 1994), recovery would be initiated through the passive action of removing livestock grazing impacts. The degree to which state-and-transition models apply and transitions have been passed will limit opportunity in the absence of active vegetation manipulation for recovery toward the reference site described. The introduction of non-native and invasive species, fire suppression activities, and sources of disturbance, other than livestock grazing and physical impacts from livestock that did not define the reference site, would continue, preventing full recovery even in the long term (decades, if not centuries).

Juniper

The no-grazing alternative would contribute little to control of juniper encroachment or additional risk of juniper dominance. As noted in Alternative 1, establishment of the majority of trees that dominate within the closed canopy juniper communities, like those in portions of the Castlehead-Lambert allotment, occurred between 1890 and 1920 (Oregon State University Agricultural Experiment Station, 2005). The elimination of livestock grazing would allow retention of additional fine fuel as compared to any of the other grazing alternatives, allowing the spread of fire more closely resembling natural conditions outside those areas dominated by juniper. Production of fine fuels in areas dominated by juniper would continue to be limited by competition with trees. Although seedlings and young juniper may be more likely to be eliminated by natural fire due to additional fine fuels, reduction of larger trees would be dependent on more extreme fire behavior.

Weeds

The no-grazing alternative eliminates the risk of introducing noxious weeds and invasive species to public lands resulting from soils disturbance by livestock activity and the increased spread of existing incursions resulting from seed distribution in fur, on hooves, and in the livestock digestive system. A number of other vectors for seed dispersal and soil disturbance would continue to provide a need for weed control programs coordinated by and with multiple entities.

Conclusion

The Idaho Rangeland Health Standard for native plant communities would continue to be met in portions of the allotment not dominated by juniper with implementation of the no-grazing alternative. Progress toward a full complement of native perennial species more consistent with ecological site potential would result in the long term, equal to or greater than the 10-year term that livestock grazing would be eliminated, pending additional evaluation. Recovery of ecological site potential vegetation communities would not occur within the 10-year period of initial livestock exclusion because recovery of all vegetation functional-structural groups from the existing ecological condition in sagebrush steppe type occurs at a slower rate, requiring at least decades, if not centuries. Implementation of the no-grazing alternative would allow progress toward meeting the ORMP vegetation management objective. The elimination of stressors to biotic function induced by livestock management practices would allow recovery limited by stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.4.1.3 Cumulative Effects

Cumulative impacts analysis area

The cumulative impacts analysis area (CIAA) for vegetation was set to the Castlehead-Lambert allotment boundary (MAP CMLV-1). BLM selected this CIAA because the direct and indirect effects of the alternative Castlehead-Lambert grazing schemes will not extend to vegetation beyond the allotment boundaries. In other words, vegetation outside of the allotment will not be meaningfully or materially impacted by the grazing management considered within the allotment. It is further worth noting that plants rooted in the soil are not transient over long distances, with the small exception of the potential for wind to distribute seeds.

Past, present, and reasonably foreseeable future actions

The temporal frame for cumulative impacts to vegetation resources is defined by the continued presence of the effects of past actions and the anticipated longevity of reasonably foreseeable future actions. Past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts analysis were calculated using BLM GIS data and are presented in Table VEG-6. The data used represent the best available information and the calculations based on the data are approximate.

Table VEG-6: Past, present, and foreseeable actions within the Castlehead-Lambert allotment CIAA for vegetation

Type of Activity	Past and Present	Reasonably foreseeable additions
Rangeland water developments: Reservoirs Developed springs	 26 8	 0 0
Wildfire	1986 – Porcupine 1991 – Red Canyon 1992 – Roaring Spring 1999 – Red Canyon 2000 – Meadow 2000 – Carter 2007 – Crutcher Crossing 2011 – Porky 23,469 acres (between 1985-	Unknown

Type of Activity	Past and Present	Reasonably foreseeable additions
	2012)	
Vegetation Treatments (Prescribed Fire and Mechanical)	3,360-acre prescribed fire – 1981 190-acre prescribed fire – 1984	
Noxious Weed Presence	6 documented infestations	Fewer than 2 acres/year new weed infestation anticipated
Roads	52 miles unsurfaced routes 0 miles surfaced roads	None

Rangeland projects have been constructed in Castlehead-Lambert to meet a number of objectives, many to facilitate livestock management. Livestock management projects that may have a long-term residual effect on vegetation include reservoir construction and spring development, which are projects designed to provide livestock water. The residual effects of surface disturbance from construction or extensive maintenance of each is limited to no more than a decade, while indirect impacts to vegetation resulting from livestock concentration at watering sources are renewed annually. Livestock concentration reduces and removes native perennial grass, forb and shrub species adjacent to each water source. Assuming a radius of less than 1/8-mile of impact to vegetation resources around each water development, the 34 water developments identified in Table VEG-6 would result in 1,067 acres of public land that is annually impacted by livestock concentration adjacent to developed water and would not improve toward reference site conditions with continued livestock grazing authorization.

Although allotment division and pasture division fence construction to date originally altered vegetation resources, residual impacts to vegetation from construction have diminished since construction, even since the most recent fence construction in 2004 to divide Castlehead and Between-the-Canyons pastures. Annual livestock trailing adjacent to some sections of fence continue localized, but unquantified impacts to vegetation resources.

Wildfire is a natural disturbance factor that is recognized in the natural variability of described reference site conditions for sagebrush/bunchgrass ecological sites. The largest impact from wildfire to native sagebrush-steppe vegetation communities is the short-term removal or reduction in the presence of sagebrush. Paysen and others (USDA USFS, 2000) identified an interval of 30 years or more for sagebrush recovery after fire under pre-1900 succession. Altered fire return intervals with changes to human ignited fires, suppression actions, and the introduction of annual species have resulted since settlement. Vegetation change in the Castlehead-Lambert allotment that has resulted from the eight fires documented since 1985, totaling 23,469 acres (some areas have burned more than once during this period) (Map FIRE-1), has resulted in the natural variability of the reference site. The location and acreage where indirect impacts have led to declining plant community health and condition due to altered fire return intervals, combined with short-term impacts from livestock grazing following wildfire (fewer than 5 years) and the dominance of annual species, cannot be quantified. As a result, the cumulative impacts of wildfire on the vegetation conditions in the CIAA are both beneficial, leading toward conditions within the natural variability of the reference site, and indirectly adverse, leading toward residual impacts that have often resulted in declining plant and vegetation community health and vigor.

Records of past vegetation treatments that have residual impacts to vegetation resources are limited two prescribed fires of 3,360 and 190 acres, with objectives to reduce juniper dominance. Reduction in juniper dominance and subsequent exclusion of livestock grazing during a period of recovery from fire impacts resulted in the improvement of native perennial plant health and vigor within the project areas.

Actions to control the introduction and expansion of noxious weeds within the CIAA are ongoing, as noted in the affected environment section (Section 3.4.1.1). Treatments are limited in size and result in the improved health and vigor of native perennial vegetation communities.

Fifty-two miles of unsurfaced routes within the CIAA, with an average 8-foot width of ongoing surface disturbance from vehicular traffic, results in 50 acres where vegetation resources remain in poor condition.

In combination, past, present and reasonably foreseeable future actions that have led toward improving vegetation health and conditions include wildfire consistent with the natural fire return interval, prescribed fire to control juniper encroachment on 3,550 acres, and ongoing control of noxious weeds on approximately 2 acres annually. Actions that have led toward declining vegetation health and vigor include the indirect effects to approximately 1,067 acres of concentrated livestock activity adjacent to water development projects, wildfire at intervals inconsistent with natural return intervals, the combined impacts to vegetation from wildfire and livestock grazing immediately following fire, and the ongoing disturbance to approximately 50 acres of unsurfaced vehicular routes. The residual effects of livestock management practices through the last few decades of the 1800s and the first few decades of the 1900s, as moderated through the remainder of the 1900s, define sagebrush steppe vegetation communities lacking the full expression of co-dominance by sagebrush species and deep rooted native perennial bunchgrass species (see Table VEGE-3). Past, present and reasonably foreseeable future actions identified above and influencing localized vegetation conditions are secondary to the direct and indirect influences of historic grazing practices on current vegetation conditions. As a result, the ORMP vegetation management objective to improve unsatisfactory and maintain satisfactory vegetation health/condition defines the cumulative effects threshold to limit downward trend away from the native perennial vegetation composition defined in the reference site of ecological site descriptions.

3.4.1.3.1 Alternative 1 Effects

Under Alternative 1, the Idaho Rangeland Health Standard for native plant communities would likely continue to be met in portions of the allotment not dominated by juniper, while progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would not result. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, downward trend in the vegetation condition within the Castlehead-Lambert allotment would not meet ORMP vegetation management objectives. The threshold for unacceptable change in vegetation condition would be exceeded.

3.4.1.3.2 Alternative 2 Effects

Under Alternative 2, in addition to those portions of the Castlehead-Lambert allotment not meeting Standard 4 due to juniper encroachment, livestock management practices would place much of the allotment at risk to fail to meet both Standard 4 and the ORMP management objective for vegetation over the long term. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, downward trend in the vegetation condition and health within the Castlehead-Lambert allotment would not meet ORMP vegetation management objectives or the Idaho Standard 4 for Rangeland Health – Native Plant Communities. The threshold for unacceptable change in vegetation condition would be exceeded.

3.4.1.3.3 Alternative 3 Effects

Under Alternative 3, the Idaho rangeland health standard for native plant communities would continue to be met in portions of the allotment not dominated by juniper. The condition of pastures 2, 3, and 4, with limitations to utilization during the active growing season, would improve and lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Castlehead-Lambert allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for Rangeland Health. Progress would be made toward improving vegetation condition below the threshold of unacceptable change.

3.4.1.3.4 Alternative 4 Effects

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use to meet resource objectives and a reduction in livestock grazing use, would result in improved native perennial plant health and vigor. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. Standard 4 would be met. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Castlehead-Lambert allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.4.1.3.5 Alternative 5 Effects

Under the no-grazing alternative, the Idaho rangeland health standard for native plant communities would continue to be met in portions of the allotment not dominated by juniper. Progress toward a full complement of native perennial species more consistent with ecological site potential would result in the long term, equal to or greater than the 10-year term that livestock grazing would be eliminated, pending additional evaluation. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Castlehead-Lambert allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.4.2 Soils

3.4.2.1.1 Affected Environment

Geology, Parent Material, and Soils

The Castlehead-Lambert allotment is located within the Upper Owyhee sub-basin and ranges in elevation from 4,700 feet near the confluence of Red Canyon and the Owyhee River breaks to more than 6,300 feet on the rhyolite summits near Juniper Mountain. The terrain is undulating to steep due to volcanic activity and geologic processes that formed foothills, structural benches, and tablelands across the landscape. Tablelands are primarily basalt in origin, while most of the other landform features are composed of welded rhyolite tuff and some breccia. Vegetation is largely defined by climate and soils, but other natural agents, including fire, can drastically alter the vegetative composition.

There are 19 different soil map units within the Castlehead-Lambert allotment, representing a wide variety of inherent characteristics that influence vegetative growth, erosion potential, site productivity, drainage class, available water supply, and more. Soils within the analysis area have been mapped and are described in the Owyhee County Soil Survey (USDA NRCS, 2003b) that delineates soil map units, landforms, vegetation components, and provides interpretive information on soil use and management.

These soils are tied to ecological sites (Map ECOL-1), which are developed based on environmental factors such as vegetation, soils, and hydrology (Appendix M – Soils and Rangeland Vegetation section).

Soil and hydrologic function are critical parameters for properly functioning upland areas. Castlehead-Lambert allotment soils are shallow to moderately deep (with deeper inclusions) and generally have a xeric (arid) soil moisture regime. Upper elevations in Castlehead-Lambert have a frigid (very cold) soil temperature regime, while lower elevations sites are mesic (moist) bordering on frigid (USDA NRCS, 2003b). Most soils are well-drained but can have very slow infiltration rates when thoroughly wet, especially if they contain a high clay content and shrink-swell potential.

Dominant soil textural classes in the Castlehead-Lambert allotment analysis area are stony loams, stony silts, sand and silt loams, and gravelly coarse sandy loams. Unweathered bedrock is present just north of pasture 4 and in pasture 3, as well as in the higher elevations and along steeper slopes of several drainages within the Castlehead-Lambert allotment. Clay content is lower (less than 26 percent) in the higher elevations in the north but steadily increases southward, with portions of pasture 2 and pasture 5, most of pasture 3, pasture 4, and lower elevations containing moderate (27 to 31 percent) to very high (36 to 54 percent) levels of clay within the upper 24 inches of soils.

The majority of ecological sites in the central and northern part of the allotment are associated with the Shallow-Claypan 12-16”, Loamy 12-16”, Loamy 13-16”, and Very Shallow Stony Loam 10-14” ecological sites (Map ECOL-1). These soils are typically loamy to clayey with high amounts of coarse fragments on the surface and in the profile. Pasture 4 is dominated by alluvial and residual parent materials that are associated with the Clayey 12-16” ecological site on the table and Loamy 12-16” below the rim.

Based on inherent soil characteristics, the erosion hazard from water is rated slight (55 percent) to moderate (41 percent), with the exception of slopes greater than 30 percent, where erosion hazard is rated severe (4 percent). In general, soils within the allotment area are stable with little to no erosion, especially where surface rock fragments provide cover and greatly modify runoff potential and sediment movement. Slopes range between 0 to 5 percent on pasture 4 with the remainder of the allotment varying between 5 to 30 percent except for steeper breaklands along several main drainages and canyons. Wind erosion hazard is rated low.

Existing Conditions

Existing conditions in the Castlehead-Lambert allotment are a reflection of past management activities and natural processes. Assessments of rangeland health completed in the January 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012a) reveals that the soil and hydrologic function integrity indicators fall in the slight-to-moderate category from reference conditions (Table SOIL-1). Although localized soil impacts are identified, overall soil and hydrologic integrity and their associated attributes are maintained. However, because overall watershed conditions are closely tied to the health of the biotic community, the current imbalance of vegetative composition is a concern where junipers encroach and dominate and where their occurrence is not a portion of site potential as identified in ecological site descriptions (USDA NRCS, 2010).

Table SOIL-1: Summary of ratings for soil stability and hydrologic function

Allotment & Pasture (#)		Meeting Standard 1 - Watershed	
	Departure Rating	**Yes**	**No**
Castlehead-Lambert	**slight-to-moderate**	**X**	
Castlehead (1)	slight-to-moderate	x	
Carter Springs (2)	slight-to-moderate	x	
Red Basin (3)	none-to-slight	x	
Lambert Table (4)	slight-to-moderate	x	
Horse Pasture (5)	none-to-slight	x	
Between the Canyons (6)	none-to-slight	x	

Erosion indicators such as pedestalled bunchgrasses and reduced soil surface resistance were commonly observed throughout the allotment but varied in intensity or were related to historic grazing. Soil stability was consistently lower in uncovered interspaces compared to those with perennial canopy. Areas of bare ground were present but not extensive due to increased amounts of coarse gravels and rocks that dominate most of the allotment landscape. Such armoring reduces water flow patterns that typically fall within expected levels on ecological sites. Mechanical damage by hoof action, such as compaction or damage to soil crusts, were noted for several sites in pasture 4 and were primarily associated with grazing during wet conditions.

Ground cover data (Table SOIL-2) collected from long-term trend sites served as an additional important indicator for soil site stability and ratings for Standard 1. Ground cover includes vegetation, litter, rock, biotic crust, and gravel, and was measured using nested frequency studies, photo plots, step-point and point intercept methods at representative areas in four pastures of the allotment. The data indicate a substantial increase in total vegetation cover, while bare ground slightly decreased but otherwise remained static. This suggests that there has been an improvement in herbaceous vegetative cover, though not enough to show substantial enhancement of soil stability and function. More durable soil cover/showed variable results or remained static, but non-persistent litter increased greatly, especially over the long-term.

Table SOIL-2: Summary of ground cover results from trend data (mid-1980s to 2011) in four plots of the Castlehead-Lambert allotment

Component	Ground Cover – Trend Summary
Bare Ground	Mostly a non-significant long- and short term decrease or static
Basal Cover	Mostly a significant long-term decrease
Non-persistent Litter	Mostly significant increase, especially long-term
Total Vegetation*	Mostly a significant increase, mixed long-term
Canopy Cover*	Incomplete data but mostly increasing
Rock/Gravel/Persistent Litter/Biotic Crust	Mixed result over long and short-term or static

*trend data from 2001 to 2011

Several fires have burned over the past two decades in the allotment, with the 2007 Crutcher Fire being the largest and most recent, impacting soils and vegetation over approximately 23,000 acres (50 percent) (Map FIRE-1). Starting from the south, it burned large portions of pasture 3 (87 percent) and pasture 6 (84 percent), all of pasture 5, and parts of pasture 2 (44 percent) and pasture 1 (22 percent). With the exception of the unburned pasture 4, the allotment was rested from 2008 to 2009 following the fire. In 2011, the Porky fire burned 14 acres on pasture 4 only.

The 2007 Crutcher fire had the largest impact by affecting approximately half of the allotment to varying degrees of severity. In areas where upland vegetation was burned or reduced, annuals and perennials are now re-establishing on-site and provide for improving upland vegetation and associated soil and hydrologic conditions. The ongoing post-fire recovery has been very good, though recovery has been slower in areas where Phase III junipers dominated before the fire.

Recent livestock grazing has had little influence on juniper encroachment, other than the removal of fine fuels that support the spread of wildfire. Even in the absence of livestock grazing, closed canopy stands produce limited shrub and herbaceous biomass. Where juniper is still encroaching after the fire, the decreased plant biomass, insufficient residual litter amounts and persistent soil cover, decreased root structure diversity, increased erosion potential, and an altered hydrologic and nutrient cycle over the long-term (more than 20 years) persist.

The northern portion of the allotment, primarily pasture 1, is most vulnerable to juniper encroachment, as it contains areas not affected by the recent fires. Refer to the juniper discussions in Appendix M - Soils and the Rangeland Vegetation section regarding concerns associated with the spread of juniper. Over the longer term, the imbalance in vegetative composition associated with juniper in comparison to ecological potential is the primary concern for upland watershed health for the Castlehead-Lambert allotment. Improvements to plant communities therefore remain static or at a downward trend regardless of whether livestock grazing occurs. Juniper is therefore not further discussed during the effects analysis for the alternatives since no vegetation treatments are proposed.

A network of roads is present in the Castlehead-Lambert allotment and provides access to every pasture. However, road conditions are variable and often deteriorate with distance from the Owyhee Scenic Byway (Mud Flats Road) located north of the allotment. To the south, the allotment is bound by the Owyhee River, which provides no direct access, except at Crutcher's Crossing during low flow. Soil disturbance from recreation is generally limited to vehicular use and restricted to existing roads and trails and has not been an issue.

3.4.2.2 Direct and Indirect Effects

Analyses of Alternative 1 and the action alternatives 2 through 5 are based on consequences of seasons and intensities of livestock grazing use on soils provided in Appendix M – Soils and the soil affected environment section for the Castlehead-Lambert allotment above. These sections provide ecological, physical, and biological concepts for expected soil impacts resulting from livestock management practices.

A detailed discussion on rangeland vegetation inventory and ecology and the state-and-transition model should be reviewed in Appendix M – Rangeland Vegetation, as they are tightly connected to upland soils. More site-specific information for the Castlehead-Lambert allotment is also available in the Rangeland Vegetation Section 3.4.1. For a continuation of processes involving upland soils and sediments and their effects on water resources, riparian areas, and wetlands, please refer to Water Resources Section 3.4.4.

3.4.2.2.1 Alternative 1 Impacts

Alternative 1 would continue to authorize grazing under the same terms and conditions as in the past, though with reduced AUMs (based on recent maximum active use) compared to the current permit (see Section 2.8.1 and Appendix D – Tables 1 and 2). The livestock grazing recent maximum use that has occurred under Alternative 1 serves as the baseline for comparison with the other alternatives.

Under Alternative 1, grazing would occur during the spring and early summer season when impacts from hoof action on wet or saturated soils are at their greatest potential to result in soil pugging (plunging hoofs into wet soil, creating a void) and compaction, though range readiness criteria would be applied. Medium- to heavy-textured soils, typically clay, are especially prone to damage during the spring grazing season because they tend to have high moisture-holding capacity, are usually at or near field capacity, or have higher water content due to snow melt. Pasture 4 would be most susceptible, as well as the lower elevations of pastures 2, 3, and 5.

Grazing during the dry summer season would occur in pastures 1 and 6 and concentrate livestock in riparian areas and their associated nearby uplands. Disproportional congregation of livestock with summer use could promote the potential of impacts to protective ground cover, resulting in compromised soil stability and hydrologic function in localized areas compared to remaining portions of the pastures.

Grazing in all other pastures would occur during the critical growing season (May 1 to July 1) in the spring and early summer and does not improve vegetation vigor, especially native perennial bunchgrass reproduction and cover, therefore increasing the overall potential for sediment movement and adverse effects to watershed health (Appendix M - Soils). These effects would be amplified if flexibility in pasture use is given, as it has been in the past (Appendix B), especially if additional growing season use occurs under the prolonged absence of rest or deferment years. On the other hand, spring and early summer season use would improve distribution throughout the pastures due to increased water availability and palatable forage on the uplands, thereby reducing soil impacts because of dispersed grazing patterns.

With livestock use during the active growing season, improvements to plant communities would be minimal or decline since rest in less than the planned 1-of-3-years cycle, as it has occurred based on actual use records, may not provide adequate opportunity for recovery of plant health and vigor following repeated years of active growing season use. The ability of desirable perennial bunchgrass species (bluebunch wheatgrass, Idaho fescue and Thurber’s needlegrass) to compete with other less desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be reduced.

The continued decline in deep-rooted bunchgrasses would likely increase bare ground and would therefore promote increased water flow patterns as patches become larger and connected. The resulting accelerated erosion and movement of sediments lead to surface loss and degradation, changes in infiltration patterns, and loss of persistent litter. This makes it increasingly more difficult for herbaceous cover to regenerate and maintain, so nutrient cycling, soil stability, and hydrologic functions are further altered over the long-term (Appendix M - Soils).

Plants grazed during the critical growing season for native perennial bunchgrasses also experience decreasing soil moisture that does not provide opportunity for regrowth before the dormant period. Pastures 2, 3, and 4 are most affected due to a reduction in seed availability that influences reproduction of deep-rooted native bunchgrass communities with repeated years of active growing-season grazing. Potential drought years, though not predictable, would further affect vegetation. The reduced ground cover would promote an increased potential for sediment movement and alter the hydrologic and nutrient cycle over the short and long term.

After the 2007 Crutcher fire removed juniper in some of pasture 1 and most of pastures 2, 3, 5, and 6, recovery of herbaceous plant and litter cover in the burned areas has provided soil stability and hydrologic function throughout the post-fire years. This has been aided by the inherently high surface gravel and rock content in this allotment, as well as a 2-year rest period immediately following the fire.

Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel would provide sites for establishment of weeds and invasive species. Indirect impacts from weeds on soils are primarily associated with changes in soil moisture availability, nutrient cycling, and a decrease in soil stability due to reduced root systems. The latter is especially a concern during the dry season and after fire. Livestock grazing is expected to contribute to the distribution of weeds and invasive species, although the 2012 Rangeland Health Assessment (USDI BLM, 2012a) and Determination (Appendix J) did not identify them as dominant.

The implementation of Alternative 1 would continue to have similar effects on the existing condition described for soils in upland watersheds. Since grazing would occur during the critical growing season with limited rest and/or deferment and flexibility would be built into the permit to allow for fluctuation in actual use (Appendix B), Alternative 1 would provide little to no improvement to ecological function and site potential because proper nutrient cycling, hydrologic cycling, and energy flow would not be enhanced. Progress toward improving soil and upland watershed resource issues and associated impacts consistent with ecological site potential are not expected to result in or allow an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.4.2.2.2 Alternative 2 Impacts

The implementation of Alternative 2 would have similar or increased negative effects on upland soil condition and watershed health as those described for Alternative 1. The added number of cattle and resulting active use by 42 percent (see Section 2.8.1 and Appendix D - Tables 1 and 2) could result in periodic utilization levels that would exceed recommended conservative stocking rates. When combined with use during the critical growing season and elimination of rest, increased utilization could negatively affect vegetation vigor, reproduction, and cover, thus elevating the potential for adverse impacts to soil and watershed health as discussed under Alternative 1.

The effects on soils from a decrease in rest or deferment are indirect, as they would not allow for recovery of deep-rooted native perennial bunchgrasses. As a result, soil moisture-holding capacity and soil stability may decline and further affect plant composition and soil productivity. This especially affects pasture 4 in years of limited precipitation and extension of the period of use to the later dates when reduced soil moisture does not provide for regrowth. Consequently, soil and hydrologic function are not expected to maintain or improve over time; rather, they decline due to a deteriorating plant community.

Although range readiness criteria is applied, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would increase with elevated stocking rates and primarily affect pastures 2, 3, 4, and 5. Increased livestock numbers are also expected to contribute to the spread of invasive annuals and exotic weeds as discussed under Alternative 1. Under Alternative 2, the concentration of soil disturbance can be deemed highest out of all alternatives and increases the risk for weed infestation and adverse impacts on soil stability and nutrient cycling because of an increase in stocking rates.

Alternative 2 would provide little to no improvement to ecological function and site potential because active use AUMs would be increased by 42 percent with no rest and little deferment during the critical growing season. The resulting impacts on desirable bunchgrass communities would have an increased potential to negatively affect watershed health while riparian grazing would put pressure on adjacent uplands during the height of the summer. Progress toward improved soil and upland watershed resource issues and associated impacts consistent with ecological site potential is not expected to result in or allow an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.4.2.2.3 Alternative 3 Impacts

Alternative 3 would improve existing condition when compared to Alternative 1 in part by implementing performance-based terms and conditions (Section 2.3) related to upland utilization (see Section 2.8.1 and

Appendix D - Tables 1 and 2). Though active use AUMs would increase by 7 percent under this alternative, this would not undermine deep-rooted perennial bunchgrass growth and vigor because their reproductive capability would be maintained by restricting utilization to slight (≤20 percent) levels during the growing season. Maintenance and recovery of bunchgrass communities would promote soil stability and watershed function and provide soil cover, decrease bare ground, and generally reduce the susceptibility of the area to accelerated erosion. Deep-rooted vegetation would increase infiltration, provide litter, and aid hydrologic function and nutrient cycling.

Since functioning upland soil and watershed processes for each ecological site are intimately tied to healthy plant communities, maintenance of native vegetation and cover is of primary interest. Additional performance-based terms and conditions for vegetative stubble height within sagebrush and perennial grassland for sage-grouse upland and riparian lentic areas would therefore also be beneficial for improving and maintaining soil stability and hydrologic function.

Although range readiness criteria would be applied under Alternative 3, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would slightly increase with elevated stocking rates. This would primarily affect pastures 2, 3, and 4. Because of an increase in active use AUMs by 7 percent, the concentration of soil disturbance would be higher with Alternative 3, compared to Alternative 1, and the risk for weed infestation and adverse impacts on soil stability, moisture retention, and nutrient cycling would increase.

The implementation of Alternative 3 is expected to improve soil and upland watershed health over Alternative 1. Despite an increase of active use AUMs by 7 percent and limited rest and/or deferment, the 20 percent upland utilization limit during the growing season and additional terms and conditions for riparian and wildlife resources are in place to improve vegetation. This would reduce grazing pressure on native bunchgrasses and provide improvement to ecological function and site potential. As a result, soil stability, productivity, hydrologic function, nutrient cycling, and energy flow and would be positively affected over the short and long term and would allow for an upward trend over the life of the permit.

3.4.2.2.4 Alternative 4 Impacts

The leading difference between Alternative 4 and Alternatives 1-3 is that there is more rest during the growing season and seasonal restrictions in this alternative. These changes result in a reduction in cattle numbers and an overall allotment-wide decrease in active use AUMs by 30 percent compared to Alternative 1 (see Section 2.8.1 and Appendix D – Tables 1 and 2).

The implementation of increased periodic deferment outside of critical growing season use is expected to increase and maintain vegetative vigor of native perennial bunchgrasses. This would positively affect soils because of improved upland vegetation communities and would provide added soil stability and hydrologic function. In the higher elevation pasture 2, grazing would end early in the critical growing season and provide opportunity for regrowth before the dormant period. Because pasture 2 would only receive early-season use, grazing in riparian areas during the height of the summer would be avoided, which would benefit soils by reducing livestock congregation along nearby uplands that could otherwise promote sediment movement into streams from concentrated use.

The restricted seasons and the resulting decrease in active use AUMs would reduce utilization levels. This would provide upland vegetation communities with an opportunity to improve and result in increased soil cover, decreased bare ground, and reduced susceptibility of the area to accelerated erosion. The overall allotment-wide reduction in cattle numbers would benefit soil and watershed health by decreasing grazing pressure on plant communities and would promote soil stability, litter, and nutrients. Pasture 3 would see a slight increase in stocking rates, though grazing would occur after the critical growing season.

Although range readiness criteria would apply under Alternative 4, the spring and early summer grazing that also occurs under the alternative would increase the potential of impacts from hoof action on wet or saturated soils as described under Alternative 1. Pasture 4 would benefit from not being grazed during spring and the onset to the critical growth season and would not be used at all if water is unavailable, allowing for additional recovery potential. This would provide for opportunity to promote plant vigor and reduce impacts from soil pugging and compaction during the wetter season compared to Alternative 1.

Pasture 5 would be used as a transition pasture and could see increased impacts to soils from compaction, displacement, and ground cover removal. This would occur over a short period of time (1 to 7 days) due to holding up to a maximum of 368 head of cattle and additional horses as livestock is moved between pastures 1 and/or 6 twice a year if pasture 4 is utilized.

While the risk of spreading noxious weeds and invasive species remains, the concentration of soil disturbance and adverse impacts on soil stability and nutrient cycling is expected to be lower for Alternative 4 because of decreased active use AUMs.

Alternative 4 would make progress toward desired conditions because the incorporation of rest and deferment from the critical growth period, along with reduced livestock numbers, would promote an increase in upland plant growth, vigor, and cover compared to Alternative 1. Although no rest is used and the number of days in each pasture during most of the rotation years are close to or greater than Alternative 1, the reduction of maximum actual use would minimize the stocking rate/critical growth period use effects, improve upland vegetation communities, and result in decreased adverse impacts to soils.

The implementation of the season-based Alternative 4 is expected to maintain or improve soil and upland watershed health over Alternative 1. With conservative or no grazing occurring during the critical growing season, Alternative 4 allows for proper nutrient cycling, hydrologic cycling, and energy flow and provides an opportunity to enhance ecological function and site potential. Improvement in soil and upland watershed resource issues and associated impacts consistent with ecological site potential would allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.4.2.2.5 Alternative 5 Impacts

Alternative 5 would eliminate all grazing in the Castlehead-Lambert allotment for 10 years and make the most significant progress toward desired conditions because soil impacts would decline and only be affected by recreational grazing (i.e., from equestrian use), wildlife, and juniper encroachment. This alternative would provide for the most unimpeded and rapid improvement of soils affected by livestock grazing but would not eliminate soil impacts resulting from other uses.

Sites that are currently impacted from grazing would move toward desired conditions of improved soil quality, increased water infiltration, and vegetative cover. Site productivity would increase and mechanical damage to the soil surface from livestock hoof action would cease. Extended rest from livestock grazing would enhance perennial plant vigor and production, along with subsequent reproduction and establishment. The increased canopy cover, surface litter, above-ground structural material, and fibrous root matter would aid in protecting the soil from both wind and water erosion. However, increased surface fuels may elevate the potential for higher soil burn severities in the event of a fire.

Soil conditions have the potential to improve over time, although recovery would depend on soil and site characteristics and climate and may not be evident in all locations. Natural processes of recovery would be achieved through cycles of wetting and drying, shrinking and swelling, freeze and thaw, root growth, and bioturbation of compacted layers, and provide additional soil organic matter. Increases in residual vegetation, energy flow and nutrient cycling, ground cover, and soil stability would improve over the long-term. Eliminating livestock disturbance would reduce the risk of weed infestation and its associated adverse impacts on soil stability and nutrient cycling though other vectors for seed dispersal remain and would continue the need for weed control programs coordinated by multiple entities.

The implementation of Alternative 5 is expected to maintain or improve soil and upland watershed health over the existing condition. The allotment would make significant progress toward meeting Rangeland Health Standard 1 and ORMP objectives because proper nutrient cycling, hydrologic cycling, energy flow, and soil and hydrologic function would be maintained or allow for an upward trend over the life of the permit and positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.4.2.3 Cumulative Effects

Analysis Area and Temporal Timeframe

Soil and watershed standards and objectives are applied to activity areas, which are the individual pastures within the allotment. The allotment is considered an appropriate geographic unit for assessing direct and indirect soil environmental effects because soil productivity is a site-specific attribute of the land and is not dependent on the productivity of an adjacent area. Similarly, if one acre of land receives incremental soil impacts – i.e., reduced soil porosity, water holding capacity, aeration, long-term productivity, etc. – and a second management activity is planned for that same site, then soil cumulative effects are possible.

The cumulative impacts analysis area (CIAA) for upland soils was set to the boundary of the Castlehead-Lambert allotment. The CIAA was selected because the direct and indirect effects of grazing management on upland soils, as well as hydrologic function and energy flow, can only be seen within the allotment boundary. Outside of this area, however, direct and indirect effects of the grazing scheme will be so small as to not create identifiable cumulative effects. At greater distances from the allotment, it becomes even more difficult to determine any impacts due the dilution effect that comes with the increased acreage.

However, through erosional and depositional processes, upland soils provide for the sediment sources that enter riparian areas and are transported within stream systems throughout the watershed and beyond. While the watershed level could be considered to serve as the CIAA for upland soils, soil and hydrologic function is site-specific. To the extent that soil movement in stream channels affects resources outside of the allotment, the direct/indirect effects and cumulative effects are considered in detail in the Water Resources Section 3.4.4.

While it is possible that cumulative impacts from sediment movement pass beyond a fence line onto a neighboring allotment or area, the primary consequence would be its impacts on streams and water quality, which is covered by Water Resources. The analysis area will not expand beyond the allotment boundary since wind erosion hazard is rated low for the allotment and beyond (USDA NRCS, 2003b). Similarly, mass failures are also a non-issue, especially since the proposed actions do not include any road construction, juniper treatment, or prescribed burns.

Based on available research and current technology, the Idaho Standards for Rangeland Health (Appendix A), ground cover trend (USDI BLM, 2012a), and the ORMP (USDI BLM, 1999a) were used as a basis for setting thresholds for measurable or observable soil properties or conditions. The threshold values, along with areal extent limits, serve as an early warning signal of reduced soil and hydrologic function. Significant changes in soil productivity of the land are indicated by changes in soil properties that are expected to result in a reduced productive capacity over the planning horizon. Likewise, declining conditions for rangeland vegetation consistent with ecological site potential contribute to deteriorating soil and hydrologic function. Vegetation therefore becomes the primary indicator that determines upland watershed health.

Additionally, in Appendix M - Soils, influences on soils from humans, general grazing, season of use, and stocking rates are discussed in greater detail. The intent is to provide an overview of commonly observed impacts, trends, and potential consequences associated with range management. These impacts are relevant to all alternatives and provide the background for the comparison of effects.

Analysis timeframes for cumulative effects include past and present activities that have created the present conditions, and reasonably foreseeable future activities planned within the next 3 years, including the expected duration of effects from current and future activities. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within three years. For this evaluation, short-term effects are those that occur approximately within the first 10 years following permit renewal, and long-term effects are those that expand 10 years or beyond.

Existing Conditions

As noted above, the CIAA for upland soils of the Castlehead-Lambert allotment is the allotment boundary that lies within portions of the Deep Creek, Headwaters Deep Creek, and Red Canyon/Owyhee River watersheds and encompasses a total of 46,049 acres (Table SOIL-3). Based on inherent soil characteristics, the erosion hazard from water is rated slight (55 percent) to moderate (41 percent), with the exception of slopes greater than 30 percent where erosion hazard is rated severe (4 percent).

Table SOIL-3: Watersheds that encompass the Castlehead-Lambert allotment

5th Field HUC	**Use acres within Watershed Acres**
Deep Creek	13,992
Headwaters Deep Creek	1,270
Red Canyon/Owyhee River	30,786
Total	**46,049**

Past, present, and reasonably foreseeable future activities within the analysis area (the Castlehead-Lambert allotment) relevant to cumulative effects were calculated using approximated BLM GIS data and are displayed in Table SOIL-4. The soils and upland watershed cumulative effects analysis area coincides with the direct and indirect analysis area, for which existing conditions are described in Section 3.4.2.1.

Table SOIL-4: Past, present, and foreseeable actions within the Castlehead-Lambert allotment CIAA

Type of Activity	**Past and Present**	**Reasonably Foreseeable Additions**
Grazing AUMs	Max. 3,162 AUMs (1986-2011)*	Permit to be renewed by 2013
Wildfire	26,167 acres (between 1985-2011)**	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	3,549 acres prescribed fire (1983 and 1984)#	Unknown
Noxious Weed Presence	6 recorded infestations	<10 acres/year of treatment anticipated
Roads	52 miles	None

Past records extend to *1986; **1960; #earliest record

Over the past decades, livestock grazing has been the dominant land use activity in the area. Wildfires have caused localized disturbances, while wildlife grazing, prescribed fire management, juniper woodcutting, and recreation have had limited effects due to their localized and small areal extent. An additional influence on the watersheds has been current and past fire and fire suppression activities. As a result, the CIAA has been altered from what would be expected under a natural disturbance regime, mainly due to an increase in juniper (see Rangeland Vegetation Section 3.4.1 and Appendix M). The allotment has been primarily grazed throughout the spring and summer and a variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs have been implemented across the landscape to aid in livestock grazing management.

The movement of upland sediment across the landscape is initiated in the form of erosion and over time reaches a water source that allows for further transport. Erosion rate, amount, and magnitude are dependent on slope, topography, climatic events, parent material, soil characteristics, vegetation, and potential localized impacts. As previously mentioned, the majority of erosion potential within the CIAA is slight to moderate. The greatest cumulative effects occur where uplands encounter non-functioning degraded riparian areas, especially perennial streams that are not meeting water quality standards (Water Resources Section 3.4.4).

However, grazing management on BLM-administered lands periodically changes in order to meet standards, which have been in place since 1997 to assess grazing activities and their impacts on resources. These periodic management changes to meet standards eventually improve overall resource conditions or make significant progress toward meeting. Additionally, the recent designation of the North Fork of the Owyhee River as a Wild and Scenic River, along with wilderness designation, should improve conditions in these areas by limiting specific land use activities.

Past, Ongoing, and Reasonably Foreseeable Activities

Livestock Grazing: Less-restrictive grazing use during the turn of the century and into the early parts of the last century has resulted in historical resource impacts that span from physical soil impacts due to high livestock numbers to increased erosion from alterations in vegetation. Restrictions and management guidelines have been implemented over the past decades and have contributed to improved upland soil and vegetative conditions. Livestock grazing within the CIAA continues to be the dominant land use activity and occurs primarily throughout the spring and summer. The pressures from grazing have physical, biological, and chemical effects to soils (Appendix M – Soils) that vary based on differences in season of use, stocking rate, and length of use.

Wildfires and Fire Suppression: Wildfires have burned approximately 26,167 acres (57 percent) in the analysis area between 1985 and 2011 and mainly affected the CIAA during the Crutcher fire in 2007 (Map FIRE-1; Table-SOIL-4 and 5). Consequent resource damage from mechanized suppression activities and burn severity have caused short-duration disturbances to soils that range from negligible to severe, depending on location, size, and severity of burn. When wildfires have burned across upland soils, the compounding impacts from temporary loss of infiltration capacity, overland flow, and increased soil erosion, have occurred in localized areas but generally decrease or vanish within 1 to 6 years (DeBano, 1981) (Dyrness, 1976) (Huffman, MacDonald, & Stednick, 2001). The change in vegetation, however, can be long-term.

Primary risks from fires in the foreseeable future are associated with upland erosion from breaklands, steep slopes, and roads, especially at stream crossings (Water Resources Section 3.4.4). Loss of soil productivity could be extended depending on burn severity, location, and post-fire climate characteristics. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery could occur and reduce potential negative effects. Grazing may also be suspended for a minimum of 2 years to allow vegetation to recover and would reduce additional impacts to soils.

Long-term effects to soils from wildfire are favorable where juniper has been removed and deep-rooted native bunchgrasses have re-established. Past and current fire suppression, however, has influenced fire frequency that has contributed to the increase of juniper across the landscape. The continual incremental effects of juniper encroachment contribute to a cumulative increase in upland erosion over the long term but can change with the probability of future wildfires.

Vegetation Treatments: Vegetation treatments, such as prescribed fires and juniper, conifer, and sagebrush control, have had limited effects on the allotment due to their localized and small extent (Tables SOIL-4 and 5). In the early1980s, 3,549 acres of prescribed fire were used to treat vegetation. No treatments are scheduled for the reasonably foreseeable future, though vegetation treatments at a later point are likely to continue and would have short-term localized impacts on upland soils, but they would benefit watershed health over the long term.

Weed Treatments: There are six documentations for weed infestations in the analysis area (Tables SOIL-4 and 5). Disturbed soils, for example, around salting areas or water developments, provide an optimal location for weed establishment and subsequent invasion and have the potential to increase localized erosion, deplete soil moisture, and alter nutrient levels. Fewer than 10 acres per year of the currently few and limited weed infestations are anticipated to be treated. Activities associated with the small areas impacted by weed treatments would have no effect on upland soils and watershed health.

Roads: The construction of roads on public lands has resulted in the removal of soils from the productive land base on approximately 52 miles of roads that traverse the analysis area (Tables SOIL-4 and 5). Depending on location, the amount of traffic that occurs on a given road, road conditions, and movement of soils, occurs and allows for sediment transport over various distances at a local or broad-scale level, adding to localized accelerated erosion across the analysis area but cumulatively covering a small percentage of the CIAA.

Road Maintenance: Additional soil impacts from proposed road maintenance activities such as grading, drainage improvements, and surfacing on existing dedicated roads will be ongoing and would produce localized soil disturbance associated with the use of heavy equipment. Some roads will receive little to no maintenance, especially if restricted or gated.

Recreation, OHV Use, and Other Activities: The analysis area is open for general motorized use that allows for hunting, fuel-wood gathering, collection of miscellaneous products, camping, and motorized touring on established roads. Recreation has had localized resource effects by exposing or compacting soil from driving, dispersed camping, or by impacting vegetation (Tables SOIL-4 and 5). Those areas that are frequented by recreationists are disturbed where soils and associated vegetation are permanently or semi-permanently altered from heavy use. Off-highway vehicle (OHV) use occurs in some areas and will continue to have localized impacts on upland soils, especially when it involves unauthorized cross-country trails. Cumulatively, these trails do not present any problems in the Castlehead-Lambert CIAA.

However, with the increase in population in the Treasure Valley and the surge in OHV use, current and future pressures on upland soils are expected to increase, especially if vehicular use and recreation expands beyond existing roads and trails. The greatest cumulative disturbance from recreational use originates from traffic along the nearby Owyhee Scenic Byway (Mud Flat Road) just north of the analysis area.

A transportation plan for Owyhee County is expected in the near future and may alleviate some concerns associated with OHV use because routes would be designated, reducing cross country and unauthorized travel. However, products resulting from travel management, such as maps and signage, are likely to result in greater visitor use, which may increase pressure on upland soils and watershed resources. The recent Wilderness and Wild and Scenic River designation along the Owyhee River is also expected to increase recreation use of this general area.

Table SOIL-5: Castlehead-Lambert allotment CIAA – summary of effects on soils

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Livestock Grazing	Ongoing, continuous	Maximum of 3,162 AUMs (in 1999)	Across entire analysis area	Moderate	Physical impacts to soils; upland watershed health changes due to shift in less desirable veg species composition
Fences	Most constructed before 1980; a few additions each decade	About 105 miles of fence	Distributed across analysis area, but cumulatively covering a small percentage of area	Low	Short-term, localized construction and maintenance disturbance; chronic cattle trails compact soils
Water Developments	Most constructed before 1980; a few additions each decade	Minimum of 34	Distributed across analysis area, but cumulatively covering a small percentage of area	Low to moderate	Short-term, localized construction and maintenance disturbance; chronic cattle congregation trampling soils
Juniper Cutting	No records for past	Potential in the future	Patchy within analysis areas	High within cutting areas; moderately low across entire area	Shift to grass/forb/shrub community increases soil stability, hydrologic function, and improves nutrient flow
Prescribed Burning	Mostly in 1980s; some scheduled for 2014	Estimated about 3,549 acres in the past; potential in the future	Patchy within analysis area	Moderately high within burn area; low across entire area	Shift to grass/forb/shrub community increases soil stability, hydrologic function, and improves nutrient flow; potential weed increase
Fire Suppression	Ongoing, continuous	Moderately effective given distance to fire facilities, etc.	Across entire analysis area	Moderate	Pros: maintains stabilizing ground cover on soils; Cons: long-term shift from grass/forb/shrub community to mostly juniper dominated area with decreased watershed function
Roads	Nearly all in place before 1980	About 52 miles of roads and routes total	Distributed across analysis area, but cumulatively covering a small percentage of area	High but localized; overall moderately low	Vegetation community shift results in increased bare soils, decreased soil stability, hydrologic function, and reduced nutrient flow.
Recreation	Ongoing, continuous	Low visitor use; hunting season off-road travel and dispersed camping	Mostly along roads	Low	Localized physical soil and veg impacts

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Weed Treatments	Ongoing, continuous	Estimated fewer than 100 acres treated since 1980s	Patchy, mostly along main routes	Low	Increased soil moisture, nutrients, and stability
Structures	Nearly all in place before 1980	A few ranch buildings	In pasture 5	Moderately high in localized areas; low across entire area	Localized physical soil impacts
Wilderness Designations	2009	8,684 acres	Along Owyhee River corridor	Low	Vehicle restrictions reduce soil and plant disturbance; reduced potential for weed spread

3.4.2.3.1 Alternative 1 and 2 Effects

Alternatives 1 and 2 would have direct and indirect effects to upland watershed soil and hydrologic function, as described in Section 3.4.2.2. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternatives 1 and 2 would cumulatively have small incremental negative effects on upland soils and their associated processes.

While the cumulative effects would be minor, the unchanged stocking rates in Alternative 1 and increased AUMs in Alternative 2, combined with the utilization of key forage species during critical growth periods, would not improve the overall vegetation health of the uplands. In the absence of adequate recovery periods for plant communities, the negative effects of the grazing scheme would contribute to a cumulative increase in soil impacts and upland erosion. The approximately 4 percent of soils rated for severe erosion potential would be further at risk since limited to no progress toward improved soil and upland watershed resource issues would be made.

Under Alternatives 1 and 2, the combined effects of the proposed grazing management, lack of improvement to vegetation, and resulting direct and indirect effects to soils would not be beneficial to upland watershed health. When these effects are considered in conjunction with the past, present, and reasonably foreseeable future actions that also affect soils in the CIAA, Alternative 1 has the highest risk to cumulatively increase erosion.

3.4.2.3.2 Alternatives 3, 4, and 5 Effects

Alternatives 3, 4, and 5 would have direct and indirect effects to upland watershed soil and hydrologic function, as described in Section 3.4.2.2. Specifically, the alternatives would improve plant communities at variable magnitudes and result in improved soil and hydrologic function that reduce erosion potential at the corresponding levels. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternatives 3, 4, and 5 would cumulatively have small incremental positive effects on upland soils and their associated processes.

Alternative 3 includes performance-based terms and conditions that would have desirable direct and indirect effects on soils despite an increase in stocking rate and initial growing season use. Adequate recovery of plant species composition and biodiversity of desirable key forage species would be promoted through the use of performance-based terms and conditions. The resulting increased soil surface protection and decrease in sediments would have desirable effects on upland soil and watershed health.

Considering the past, present, and reasonably foreseeable future actions influencing soils in the CIAA, the impacts from Alternative 3 would have a positive cumulative effect over Alternatives 1 and 2 by decreasing sediment movement that would otherwise be destined to reach riparian areas and streams.

The season-based Alternative 4 is expected to have similar positive cumulative effects as Alternative 3; however, because Alternative 4 would restrict grazing during the critical growth season of desirable key forage species altogether and therefore result in reduced stocking rates further decreasing grazing impacts, Alternative 4 would provide additional protection compared to the implementation of Alternatives 1, 2, and 3.

The cumulative effects of Alternative 5 would provide extended rest from livestock grazing over the life of the permit. The improvements would be similar to Alternatives 3 and 4, although the incremental effects associated with the recovery of soil stability, hydrologic function, and nutrient cycling affecting upland soils and watershed health would occur at a faster rate due to the absence of livestock grazing. Cumulatively, this would offer the greatest benefits to the CIAA.

All three alternatives would maintain and benefit upland soils to varying degrees and result in the capture, storage, and safe release of precipitation, as well as improve energy flow and nutrient cycling in the analysis area. The approximately 4 percent of soils rated for severe erosion potential would experience less risk since improvements toward soil and upland watershed resource issues are made. The proposed changes in grazing management would make progress toward meeting Rangeland Health Standards and ORMP objectives and cumulatively provide improvements to the CIAA.

3.4.3 Special Status Plant Species

3.4.3.1 Affected Environment

The standards that apply to special status plant species (SSPS) in Idaho include Idaho Standard 8 - Threatened and Endangered Plants and Animals and the ORMP special status species objective *SPSS-1: Manage special status species and habitats to increase or maintain populations at levels where their existence is no longer threatened and there is no need for listing under the Endangered Species Act of 1973*.

Information for existing conditions in the Castlehead-Lambert allotment was provided through Elemental Occurrence (EO) reports from the Idaho Department of Fish and Game Heritage Program and observation reports in the Owyhee Field Office. (Data was analyzed for Special Status Plant Species (SSPS) updates. Special Status Plant Species Elemental Occurrence reports for Castlehead-Lambert allotment were completed from 1994 to 2007 and provide updates on special status species for this allotment.) (Occurrence locations are shown on Map SSPS-1) The IDFG provided plant observation reports using methodologies described in their report protocols. All other reports reviewed use best-practice science in updating rare plant occurrences and reporting updates to IDFG. NatureServe and its Natural Heritage Program members have developed standardized methods for gathering, managing, and analyzing biological and ecological data, referred collectively as Natural Heritage Methodology.

Two BLM special status plant species known are to occur within the Castlehead allotment: mountain ball cactus (*Pediocactus simpsonii*) in pasture 3 and thinleaf goldenhead (*Pyrrocoma linearis*)[33] in pastures 1

[33] Previously identified as one-flowered goldenweed (*Haplopappus uniflorus* var. *howellii*), but updated taxonomic work indicates that the current name for this plant is Pyrrocoma linearis and it has a more limited distribution than previously thought (Bogler, 2006).

and 6 (Table SSPS-1). Special status plant information is based on botanical surveys conducted in the Castlehead-Lambert allotment, BLM records, and data on file with Idaho Natural Heritage Program (INHP). Systematic inventories for special status plants have not been conducted in this allotment. Incidental clearance surveys for other projects are the main sources for locating known occurrences within the allotment, although the number of projects and subsequent acres surveyed is minimal in this area.

Table SSPS-1: Castlehead- Lambert special status plant occurrences by pasture

		Pasture & No. of Occurrences					
Scientific Name	**Common Name**	**1**	**2**	**3**	**4**	**5**	**6**
Pyrocomma linearis	Thinleaf goldenweed	1					1
Pediocactus simpsonii	Mountain ball cactus			4			

There are no known special status plants in pastures 2, 4, 5, and 6.

No plants listed or proposed under the Endangered Species Act are known or suspected to occur within the Castlehead-Lambert allotment (USDI USFWS, 2009). Slickspot peppergrass (*Lepidium papilliferum*) is proposed as threatened under the Endangered Species Act and occurs in eastern Owyhee County but is not currently known from western Owyhee County or the Owyhee Field Office Resource Area (USDI USFWS, 2010a)[34].

Thinleaf goldenhead (*Pyrocomma linearis*) has been found in pastures 1 and 6. This perennial plant is in the sunflower family. It generally begins growth in March or April, flowers in May and June, sets seed in early July, and is dormant by August. It occurs in seasonally wet meadows, drainages, and on the banks of perennial streams or springs, these areas are sensitive to grazing impacts. Thinleaf goldenhead is a BLM Type 3 species. BLM Type 3 Special Status Plant (SSP) species are globally rare or very rare in Idaho, with moderate endangerment factors. Their global or state rarity and the inherent risks associated with rarity make them an imperiled species.

Mountain ball cactus (*Pediocactus simpsonii*) is the only special status plant known to occur in pasture 3 (Figure SSPS-1). This perennial barrel-type cactus bears yellow or purplish flowers in the early spring with seeds produced in June. Plants are, typically found in solitary arrangements, with spherical morphology and strong vertical ridges with dark spines. Habitat for this species includes exposed ridges, rocky or sandy benches and canyon rims in low sagebrush, bud sage (*Picrothamnus desertorum*), and Sandberg bluegrass communities, which are all areas unlikely to be impacted heavily by grazing. It is a BLM Type 4 species. BLM Type 4 species are generally rare in Idaho, with small populations or localized distribution, and currently have low threat levels. The known populations of both thinleaf goldenhead and mountain ball cactus indicates this plant is neither increasing nor declining as a population; however, there is insufficient information to determine site-specific impacts of livestock grazing on this particular special status plant.

Figure SSPS-1: Mountain ball cactus

[34] Memorandum decision and order, US District Court, Case No. 1:11-ev-oo358-CWD, Aug. 8, 2012. Listing of *L. papilliferum* as a threatened species under the Endangered Species Act is vacated; however, it is remanded for further consideration.


(USDI NRCS, 2012)

3.4.3.2 Direct and Indirect Effects

The impacts discussed below under each alternative focus primarily on differences among season of use. A reduction in livestock numbers and time and duration has a positive effect on special status plant species and the vegetative community overall. For the Castlehead-Lambert allotment impact analysis, the seasons of use are defined as: Spring (3/1 to 6/30), Summer (7/1 to 9/30), and Fall (10/1 to 11/30). The season of use for the grazing alternatives is primarily a spring and summer rotation with rest years included into the rotation for pastures 2, 3 and 4 and no rest for pastures 1 and 6 (see Section 2.8.1 Management Actions for Each Allotment). (Plant descriptions are located in 3.5.3.1 of this EA.)

Table SSPS-2: Effects of livestock grazing on Special Status Plant Species habitats by season of use; similar in context to Table RIPN-10

Season of Use	**Issues & Impacts**	
Spring (March-June)	▪ Soil compaction	• increased exposed ground, increasing erosion • removal of vegetation • increased non-native species • decreased herbaceous cover • decreased vegetation reproductive capabilities • decreased species and age diversity • decline of biological soil crust • reduced groundwater recharge
	▪ Selective grazing on palatable species	• decrease soil stability • decreased vegetative diversity • decreased pollinator forage • decreased vegetation reproductive capabilities
Summer (July-September)	• Browsing on grass and shrubs	• decreased grass and shrub cover • decreased species and age diversity • decreased herbaceous cover

Season of Use	Issues & Impacts	
		• loss of wildlife habitat
Season Long (March-September)	▪ Browsing on grass and shrubs	• decreased grass and shrub cover • decreased species and age diversity • decreased herbaceous cover • decreased biological soil crust • decreased pollinator forage • decreased vegetation reproductive capabilities • decline in soil stability
	▪ Continuous grazing	• decreased grass and shrub cover • decreased species and age diversity • decreased herbaceous cover • decreased pollinator forage • decreased vegetation reproductive capabilities • decline of biological soil crust • decline in soil stability
All Seasons	▪ Loss of herbaceous vegetation	• decreased soil stability • change in functional and structural groups • removal of vegetation • decreased biological soil crust • decreased pollinator forage • decreased vegetation reproductive capabilities • reduced habitat quality for insects • reduced water infiltration • increased soil erosion • reduced wildlife habitat • reduced aesthetic value
	▪ Manure deposition, trampling and congregation	• decreased soil stability • removal of vegetation • increased non-native species • decreased pollinator forage • nutrients, pathogens, and bacteria added to ecological system • reduced habitat quality • reduced aesthetic value
	▪ Water and salt placement	• decreased soil stability • removal of vegetation • removal of biological soil crust • loss of shrub understory • decreased pollinator forage • increased non-native species • reduced wildlife habitat

Season of Use	Issues & Impacts	
		• reduced aesthetic value

(*Adapted from* (Bellows, 2003) *and* (Belsky, Matzke, & Uselman, 1999)*)*

Summary

The habitat location, soil components, precipitation, and threats to SSPS plants are the primary factors that influence the health and vigor of a population. Any changes to the localized habitat affect this vigor and viability. Where junipers dominate, vegetation communities do not have a full complement of dominant grasses and shrubs consistent with site potential within the Castlehead-Lambert allotment; however, outside juniper-dominated areas, healthy, productive, and diverse populations of native plants dominate and are maintained. Recent observations on populations with similar grazing patterns suggest that a deferred grazing management practice, such as within pasture 1 and 6, is not significantly impacting thinleaf goldenhead occurrences, presumably because these are generally used after mid-July, by which time flowering is typically complete and fruiting is underway. Also, this plant's growing points are at or below ground level, making it somewhat resilient to grazing and trampling effects after seed set.

Mountain ball cactus is not sought out as grazing forage; plant damage would occur from trampling during the spring season when it flowers. Mountain ball cactus populations in pasture 3 were reported in good to excellent condition in 2005 when the most current observation report was written.

3.4.3.2.1 Alternative 1 Effects

Implementation of Alternative 1 would continue current livestock management actions. The management objective for vegetation identified in the ORMP is to improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas. The 2012 Rangeland Health Assessment and Evaluation Report for this allotment (USDI BLM, 2012a) and the Determination (Appendix I) identified a general short-term and long-term static trend in the frequency of desirable native bunchgrass species (bluebunch wheatgrass, Idaho fescue, and Thurber's needlegrass). That static trend is at an ecological condition depressed from the identified site potential or desired in the ORMP vegetation objective. Although that depressed ecological condition was found to be largely a product of grazing management practices in the late 1800s and early years of the 20^{th} century, as well as a product of extended fire return intervals resulting in the encroachment by juniper trees into sagebrush steppe vegetation communities (National Research Council, 1994) (USDI BLM, 2012a), the recent trends of desirable native perennial bunchgrasses do not indicate progress toward improved ecological conditions.

Under Alternative 1, the six pastures would essentially be used on a 6-year rest/rotation cycle. There is insufficient information to determine current status to site-specific impacts from this alternative; however, the special status plant species would continue in their known status under this grazing scheme. The resource issues identified in the allotment assessment (USDI BLM, 2012a) and the general impacts are displayed in Table SSPS-2.

3.4.3.2.2 Alternative 2 Effects

Alternative 2 is the permittees' (06 Livestock Co. and the Maestrejuans) applications and, unlike Alternative 1, is essentially a 2-year spring-summer rotation grazing system among the six pastures (Table ALT-7) and does not include any rest years.

The mountain ball cactus population in pasture 3 was reported in good to excellent condition in 2005, when the last known observation report was taken. As noted in the summary, this SSPS plant is not sought out as grazing forage; the possible plant damage is from the trampling of the plants during the spring season when it flowers. There is insufficient information to determine current status to site-specific impacts from this alternative; however, the known status for this special status plant species would continue under this grazing scheme. The resource impacts identified in the allotment assessment (USDI BLM, 2012a) and the general impacts are displayed in Table SSPS-2.

The implementation of Alternative 2 would have similar results and would impact the ability meet the ORMP objectives as described above. Resource conditions would either remain as they are currently (see the Affected Environment) or would degrade further. Although the Idaho Rangeland Health Standard for special status plant species may continue to be met in the allotment with implementation of the applicants' proposed action, progress toward improvement for the SSPS with a full complement of native perennial species consistent with ecological site potential would not result. Additionally, the Rangeland Health Standards associated with the special status plant species might not be attainable because the pastures would be grazed frequently during the active growing season. This would not improve the allotment.

3.4.3.2.3 Alternative 3 Effects

Alternative 3 is a performance-based alternative that was developed based on the grazing system that currently occurs, as described in detail under Alternative 1. The seasons of use, duration, intensity, and stocking rates would be the same as Alternative 1; the difference would be the incorporation of performance-based terms and conditions. For protection of the special status plant species, the standards are tiered to the metrics from the sage-grouse performance-based terms and conditions (Table ALT-1).

Standards developed for sage-grouse habitat areas will also apply to special status plant species. Specifically, the performance-based terms and conditions related to utilization, streambank alteration, woody browse use, and stubble-height will improve plant diversity and pollinator forage and will generally maintain or improve the health and vigor of upland perennial herbaceous species while maintaining hydrologic function. The standards will also improve soil/site stability and provide suitable habitats for special status wildlife species, thus improving the habitat in which SSPS grow. Alternative 3 will facilitate meeting Standard 8 – Threatened and Endangered Animals and the ORMP special status objective for animals (sage-grouse) *SPSS-1: Manage special status species and habitats to increase or maintain populations at levels where their existence is no longer threatened and there is no need for listing under the Endangered Species Act of 1973.*

This alternative would result in an improvement for SSPS plants on this allotment. There is insufficient information to determine current status to site-specific impacts from this alternative; however, the special status plant species would continue or improve from their known status under this grazing scheme.

3.4.3.2.4 Alternative 4 Effects

Alternative 4 was developed in response to the existing condition of the allotment (see the Affected Environment section), the impacts affecting the resources present within the allotment, and the resource objectives set in the ORMP. Alternative 4 is a 2-year rotation system with grazing time constraints intended to protect upland vegetation, riparian area condition, and sage-grouse habitat, thus protecting SSPS plants.

Of all of the grazing alternatives, Alternative 4 would make the most significant progress toward desired conditions because the incorporation of rest and deferment from the critical growth period would increase upland plant growth, vigor, and cover compared to the other grazing alternatives. Shorter grazing periods, no spring grazing in pasture 4, and a reduction of active AUMs would minimize the stocking rate/critical growth period use effects, improve upland vegetation and riparian communities, and result in decreased adverse impacts to special status plant species. As a result, the ecological condition of native upland vegetation communities would be expected to improve due to the proposed decreased stocking rate. There is insufficient information to determine the current status to site-specific impacts from this alternative; however, the special status plant species would continue or improve from their known status under this grazing scheme.

3.4.3.2.5 Alternative 5 Effects

Alternative 5 is a no-grazing prescription. Grazing would not occur on the allotment for the duration of 10 years. The effects of no grazing include: sites that are currently impacted from grazing would move toward desired conditions of improved plant quality and diversity, water infiltration, and riparian resources. Extended rest from livestock grazing would enhance perennial plant vigor and production, along with subsequent reproduction and establishment. Natural processes of recovery would be achieved through plant succession and reproductive growth.

3.4.3.3 Cumulative Effects

A cumulative effect is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative impacts focus on the aggregate effects of the past, present, and reasonably foreseeable future actions that are meaningful and must analyze the significant effects of the proposed action and alternatives. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within 3 years.

Plants do not have political boundaries and are ranked on a global and state rarity ranking. The cumulative impacts analysis area (CIAA) for SSPS incorporates and extends beyond the allotment boundary to capture the assessment units (plant populations) within the watershed boundaries for the Group 1 EA. The watersheds include Deep Creek, the Headwaters Deep Creek, and the Red Canyon/ Owyhee River watersheds.

Past, present, and reasonable foreseeable future activities within the CIAA relevant to cumulative effects were calculated using approximated BLM GIS data and are displayed in Table SSPS-3 (including the expected duration of effects from current and future activities (generally up to 10 years)). Their contributions to cumulative effects are low-risk when combined with other activities in the Castlehead-Lambert allotment. Cumulative effects on the special status plant species is small due to the location where activities might take place in relation to the greater analysis area, the size of the activity and the magnitude of its effects, or the mitigation that would be applied during implementation.

Focal Special Status Plant Species

Thinleaf goldenhead (*Pyrocomma linearis*) has been found in pastures 1 and 6. It generally begins growth in March or April, flowers in May and June, sets seed in early July, and is dormant by August. It occurs in seasonally wet meadows, drainages, and on the banks of perennial streams or springs. Due to the small populations and habitat area, future land uses in close proximity could jeopardize these species.

Mountain ball cactus (*Pediocactus simpsonii*) is the only known special status plant that occurs in pasture 3. This perennial barrel-type cactus flowers in spring and produces seeds in June. Habitat for this species includes rocky or sandy benches and canyon rims in low sagebrush, bud sage (*Picrothamnus desertorum*), and Sandberg bluegrass communities. Due to the small populations and habitat area, future land uses in close proximity could jeopardize these species.

Cumulative Impact Area Activities
Figures in the following table of past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts were calculated using BLM GIS data. Data are approximate.

Table SSPS-3: Past, present, and foreseeable actions within the Castlehead-Lambert allotment CIAA

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing Allotments	22 active BLM allotments	Permits are renewed/modified as they expire: 4 to be processed by 2015
Wildfire	82,663 acres (between 1985-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	28,378 acres (1952-2011)	9,750 acres
Noxious Weed Presence	47 infestations covering about 40 acres	Fewer than 10 acres/year of new weed infestation anticipated
Agriculture	57 acres	None
Roads (all are unpaved)	281.5 miles	None

Existing Conditions

The analysis area has been affected by various land use activities that have and will continue to impact special status plant species through impacts to upland watersheds, wildlife, soil stability, and rangeland vegetation. Wildlife grazing and wildfires have caused localized disturbances in the analysis area. In recent years, human-caused disturbances such as prescribed fires, juniper woodcutting, and recreational activities have had limited effects on the special status plant species, due to their localized and small areal extent. Almost all of the land (about 95 percent) is managed for grazing, which has been the dominant land use activity in the area, though current and past fire and fire suppression activities have had additional influence on the special status plant species.

As a result of these activities, the overall landscape across the cumulative effects analysis area has been altered, due to an increase in juniper from what would be expected under a natural disturbance regime, as described in Rangeland Vegetation Section 3.4.1.1. Allotments in this area are primarily grazed throughout the spring and summer and a variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs, have been implemented across the landscape to aid in livestock grazing management. The allotments in the analysis area are in various stages of the 10-year permit renewal cycle, and as expiration dates approach, each allotment will be evaluated for rangeland health and progress toward meeting Standards prior to the authorization of a new permit.

Increasing population in the Treasure Valley and an increasing popularity of off-highway vehicles (OHVs) are creating additional pressures on the special status plant species from recreation uses (OHV, mountain biking, camping, horseback riding, etc.). The recent Wilderness and Wild and Scenic River designation is also expected to increase recreation use of this general area. There are approximately 281 miles of unpaved roads traversing the analysis area. Depending on the amount of traffic that occurs on a given road, the disturbed vegetation species both on a site specific scale as well as overall landscape scale are at risk of disturbance.

All known special status plant species locations are shown in table SSPS-1 (Section 3.4.3.1 of this EA).

3.4.3.3.1 Alternatives 1 & 2 Effects

If either Alternatives 1 or 2 were implemented, they would have similar cumulative effects for the Current Situation alternative and the permittees' proposed action. These alternatives would not contribute to meeting the land-use plan special status species management objective and would increase the likelihood that livestock management practices, primarily increased levels of livestock grazing with seasons of use that do not allow adequate recovery of health and vigor of native perennial species, would contribute to not meeting the Idaho Rangeland Health Standard for native plant species. This would have a direct effect on the plant diversity, pollinator forage, and health and vigor of the SSPS. Under Alternatives 1 and 2, conditions for SSPS within the analysis area are not expected to improve.

3.4.3.3.2 Alternatives 3 & 4 Effects

If either Alternative 3 or 4 were implemented, the improvement to upland and riparian vegetation would occur within the allotment and would cumulatively improve the conditions within the analysis area. Present and future proposed changes in grazing management, when added to these alternatives, are expected to improve upland soils by increasing deep-rooted native perennial bunchgrasses that promote a decrease in erosion as upland vegetation and riparian communities and watershed health improve.

The impacts of these alternatives, when cumulatively adjoined to the grazing occurring in surrounding allotments, would improve the condition of upland and riparian vegetation and watershed health within the analysis area. The season-based Alternative 4 is expected to have additional benefits over Alternative 3 because the incorporation of season-based rest and deferment from the critical growth period would increase upland plant growth, vigor, and cover and result in decreased adverse impacts to upland and riparian vegetation. Both alternatives would maintain and improve vegetation habitat by improving pollinator forage, biological soil crusts, and upland soils, thus improving energy flow and nutrient cycling in the analysis area.

3.4.3.3.3 Alternative 5 Effects

Cumulative effects of Alternative 5 would combine extended rest from livestock grazing and proposed changes in grazing management in adjacent allotments aimed at making progress toward meeting Rangeland Health Standards. The impacts would be similar to Alternatives 3 and 4, though the incremental effects from resource improvements would occur at a faster rate due to the absence of livestock grazing. Cumulatively, this would offer increased vigor, and establishment of perennial bunch grasses to the analysis area. Implementation of the no-grazing alternative would allow progress toward meeting the ORMP vegetation management objective.

3.4.4 Water Resources and Riparian-wetland Areas

3.4.4.1 Affected Environment

Introduction

The Castlehead-Lambert grazing allotment falls within the Upper Owyhee watershed, hydrologic unit code 17050104, and encompasses a large area in southwest Idaho (Map CMLV-1). The headwaters for the Owyhee River, also known as the East Fork, originate in the Independence and Bull Run Mountains in northern Nevada. Within the Idaho portion of the watershed, there are 15 assessment units (AUs). AUs are groups of similar streams, with the same stream order, that have similar land use practices, ownership, or land management. The Idaho Department of Environmental Quality (IDEQ) has completed total maximum daily loads (TMDLs) for sediment and temperature for these AUs, but the watersheds do not meet their beneficial uses, which include cold-water aquatic life and primary contact recreation. The goal of the TMDLs is to achieve State of Idaho water quality standards and to restore and maintain a healthy and balanced biological community for the full support of cold-water aquatic life and salmonid spawning.

Cold-water aquatic life water bodies are defined as "water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species." Two of the listed units are reservoirs, Juniper Basin and Blue Creek Reservoirs.

Streams within the allotment that are identified by the IDEQ as not supporting the assigned beneficial uses include Beaver, Castle, Little Smith, and Red Canyon Creeks, and their tributaries. The issues IDEQ has identified within the watershed are temperature exceedences and excessive sediment (2009). Streams that have been through the reconnaissance process and were placed on the 303(d) list due to excessive temperature, sedimentation and siltation include Beaver and Little Smith Creeks (Map RNGE-1), and their tributaries.

The National Hydrography Dataset (NHD) was produced between 1996 and 2000 via a collaborative effort among the Environmental Protection Agency (EPA), the U.S. Geological Survey (USGS), and other federal, state and local agencies. The NHD is a comprehensive set of digital geospatial data about surface water features such as streams, rivers, lakes and springs/seeps and is maintained by the USGS.

According to the NHD, the Castlehead-Lambert allotment contains approximately 22 miles of perennial and more than 100 miles of intermittent streams[35] (Tables RIPN-3 and -4). The NHD does not differentiate between intermittent and ephemeral streams; thus, many of the intermittent streams are ephemeral drainages that do not support riparian vegetation (USDA FSA, 2011). Major perennial streams located all or in part within the allotment include Little Smith, Beaver, and Castle Creeks, and the East Fork, West Fork and Red Canyon.

The NHD identifies 37 springs/seeps that occur within the allotment (Table RIPN-3). They are all located in the northern four pastures, and they support areas of riparian-wetland vegetation and provide the contributing waters for the streams. Because the NHD is not comprehensive and the number of springs/ seeps and associated riparian-wetland areas are underestimated, the 2011 NAIP was used to supplement those identified by the NHD (Table RIPN-3).

Table RIPN-3: Total miles of perennial and intermittent stream, and number of springs (based on NHD) within pastures within the Castlehead-Lambert allotment

Pasture #	Pasture Name	Perennial Miles	Intermittent Miles	# Springs (NHD)	Spring Riparian Acres[36]
1	Castlehead	2.7	7.1	12	24.05
2	Carter Springs	0.25	39.75	5	14.75
3	Red Basin	1.1	34.7	1	48.0
4	Lambert Table	0	16.75	0	4.8
5	Horse pasture	0.4	9.0	5	0.6
6	Between-the-Canyons	14.9	13.0	14	12.65
Total	**All**	**19.35**	**120.3**	**37**	**104.85**

[35] Perennial: Contains water throughout the year, except for infrequent periods of severe drought
Intermittent: Contains water for only part of the year, but more than just after rainstorms and at snowmelt
Ephemeral: Flows in normal water years only in direct response to precipitation and channel is above the water table at all times
[36] Estimated based on acreages recorded during field assessments and supplemented using a GIS, NHD, and NAIP 2011 at a scale of 1:1000

Table RIPN-4: Total miles of perennial and intermittent stream within each pasture of the Castlehead-Lambert allotment

Stream Name	Flow Type	Pasture 1 Castlehead	Pasture 2 Carter Springs	Pasture 3 Red Basin	Pasture 4 Lambert Table	Pasture 5 Horse Pasture	Pasture 6 Between-the-Canyon	Total Miles
Beaver Creek	Intermittent		4.57					4.57
Carter Creek	Intermittent		5.38					5.38
Castle Creek	Intermittent	1.92						1.92
EF Rad Canyon	Perennial						2.90	2.90
Little Smith Creek	Perennial	1.25						1.25
Moonshine Creek	Perennial	0.06						0.06
Porcupine Creek	Intermittent				1.79			1.79
Red Basin	Intermittent			8.48				8.48
Red Canyon	Perennial			1.23				1.23
Trap Creek	Intermittent		1.52					1.52
WF Red Canyon	Perennial						3.76	3.76
Unnamed Creeks	Intermittent	5.25	23.27	20.75	24.18	7.18	13.01	93.65
Total Miles		**9.83**	**35.28**	**30.52**	**26.22**	**7.83**	**27.86**	**126.5**

Desired Condition and Resource Objectives

This EA and the resource objectives discussed tier in part to the objectives identified in the ORMP EIS. The objective specified in the management plan for both riparian-wetland areas and stream channels is to "maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions. Riparian-wetland areas include streams, springs, seeps, and wetlands." The BLM has primarily utilized the lotic and lentic[37] proper functioning condition (PFC)[38] protocols to determine whether the objective is being met. The PFC assessment is a qualitative determination that refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian-wetland areas. Essentially, a PFC determination rates the state of resiliency that will allow a riparian area to hold together during a high-flow event, which then allows the area to provide desired values (i.e., wildlife habitat).

Leonard and Karl (1995) state, "Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. Even though this definition emphasizes lotic areas, it can be applied to lentic areas with minor modification. For example, instead of 'adequate vegetation...present to dissipate stream energies...' an assessment would determine whether adequate vegetation, etc., is present to dissipate wind and wave energies."

The BLM employs several additional assessment methods that aid in interpreting the condition of the water and riparian resources and thus the ORMP objective. Most recently, the Multiple Indicator Monitoring method (MIM)[39] has been finalized. MIM is a quantitative monitoring and analysis method used to assess the long-term trend of a designated stream reach. MIM can be used to help evaluate livestock grazing management (i.e., timing, duration, and frequency of grazing), and to determine how the vegetation and stream channels are responding to herbivore use. Monitoring data is gathered for 10 indicators to assess the current condition and trend of the stream banks, channel, and vegetation. From the gathered data, an evaluation is made for the stream reach in relation to the following three capability groups: 1) ecological status, 2) vegetation-erosion resistance (i.e., stream bank stability), and 3) site wetland status. Depending on the objectives for an area or stream, the MIM method can also be modified (MMIM) allowing the observers to collect either the three short-term indicators (i.e., stubble height, woody browse, and bank alteration) or any of the indicators of interest.

The ORMP objective for water quality is to "meet or exceed State of Idaho water quality standards on all federally administered waters." To assess and interpret whether this objective is met for an area, a stream, and/or a stream segment, the BLM utilizes watershed information collected by IDEQ and collects water temperature and bacteria information internally.

---

[37] Lotic = flowing water. Lentic = standing water, e.g. a seep or pond.

[38] PFC Assessments are based on Interagency Technical Reference 1737-15, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lotic Areas* and 1737-16, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lentic Areas*

[39] MIM: Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation*

Current Condition

The ORMP identified perennial and fish-bearing streams that occur on public lands and included an assessment of the mileage present and the condition at the time (1999). The streams identified include:

- The East Fork (EF) Red Canyon with 8.79 miles in unsatisfactory condition;
- Little Smith Creek with 0.81 miles in unsatisfactory condition;
- Red Canyon with 9.26 miles in unsatisfactory condition and 1.17 miles in satisfactory condition; and
- The West Fork (WF) Red Canyon with 2.44 miles in unsatisfactory condition.

The ORMP refers to streams and riparian-wetland areas in unsatisfactory condition as those that were either functional-at-risk or NF.

Pasture 1 – Castlehead

According to the NHD, pasture 1 contains approximately 2.7 miles of perennial streams, 7.1 miles of intermittent streams, and 12 spring-seeps (24.05 acres). More than 13 miles of the streams have been assessed using the PFC protocol: approximately 1.0 mile is in PFC[40] and about 10 miles are functional-at-risk[41]. Eight of the springs have been assessed; two are non-functional[42], one is FAR, and five are properly functioning (Tables RIPN-2 and -3, Map RNGE-1). Two of the eight springs (Wonder and Boggy Spring) were assessed as FAR and NF in 2003 and were re-assessed in PFC in 2009, indicating an upward trend in condition. In addition, two reaches of stream have been monitored using the MIM method (Tables RIPN-5 and -6), and two greenline transects[43] were established in 2004. Both the MIM sites and the greenline transects were established on Little Smith and Castle Creeks.

The reaches of stream that are accessible and the springs/seeps that are not protected from livestock are not functioning properly, in terms of the resiliency that allows a riparian area to hold together during a high-flow event, which then provides desired values (i.e., floodplain development, sediment filtration, and wildlife habitat) to the area. Some of the specific issues identified include a lack of bank-stabilizing species of riparian-wetland vegetation, deeply incised stream channels, a high percentage of bare ground, and a general loss of soil. Issues associated specifically with the stream channels include over-widening of stream channels, deeply incised channels, and laterally and vertically (presence of headcuts) unstable channels. Issues identified specific to the lentic areas include shrinking riparian areas, and upland species appearing in the riparian areas.

Information collected at the MIM sites had similar results. Both reaches of stream have a lack of hydric vegetation, are not meeting the stream bank stability criteria, and their vegetation-resistance erosion index is low to moderate.

Portions of both Beaver and Little Smith Creeks that occur in pasture 1 are identified on the IDEQ 303(d) list as impaired waters (Map RNGE-1). The BLM has monitored water temperatures in both the EF and WF of Red Canyon (Figures RIPN-1 and -2); both streams exceeded the State's criteria for support of the cold water aquatic life beneficial use. The criteria, as defined by the State, sets a Maximum Daily

[40] PFC indicates a riparian-wetland area has adequate vegetation, landform, or large woody debris present to dissipate stream energy, filter sediment, aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.
[41] FAR indicates that the riparian-wetland area is in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.
[42] NF indicates that the riparian-wetland area does not have sufficient vegetation, landform, or large woody debris to dissipate stream energy, filter sediment, aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.
[43] Greenline transects are based on BLM Technical Reference 1737-8, *Greenline riparian-wetland monitoring : Riparian area management*

Maximum Temperature (MDMT) of 22° C and a Maximum Daily Average Temperature (MDAT) of 19° C.

Figure RIPN-1: EF Red Canyon temperature information, 2004 (MDMT = 32.1°C and MDAT = 16.6°C)

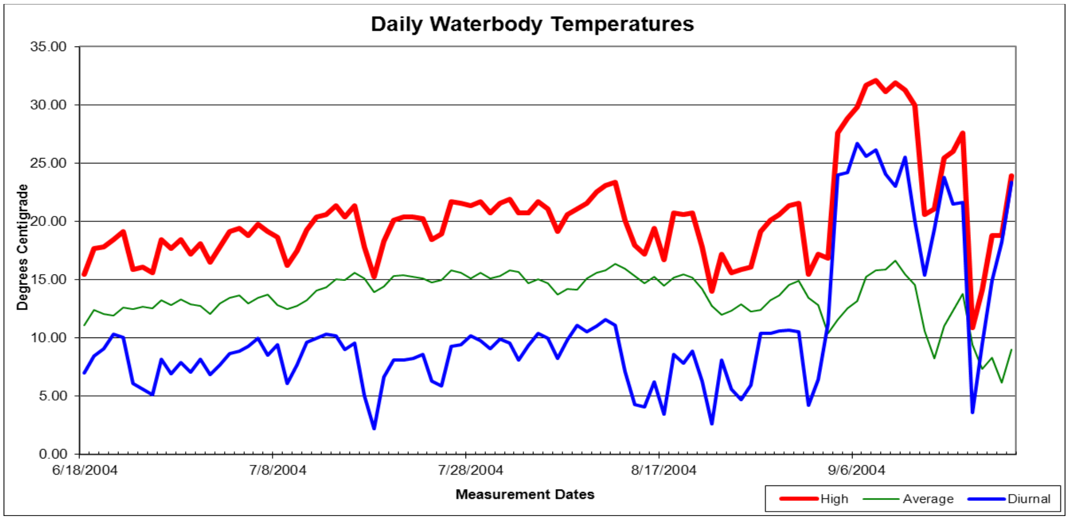
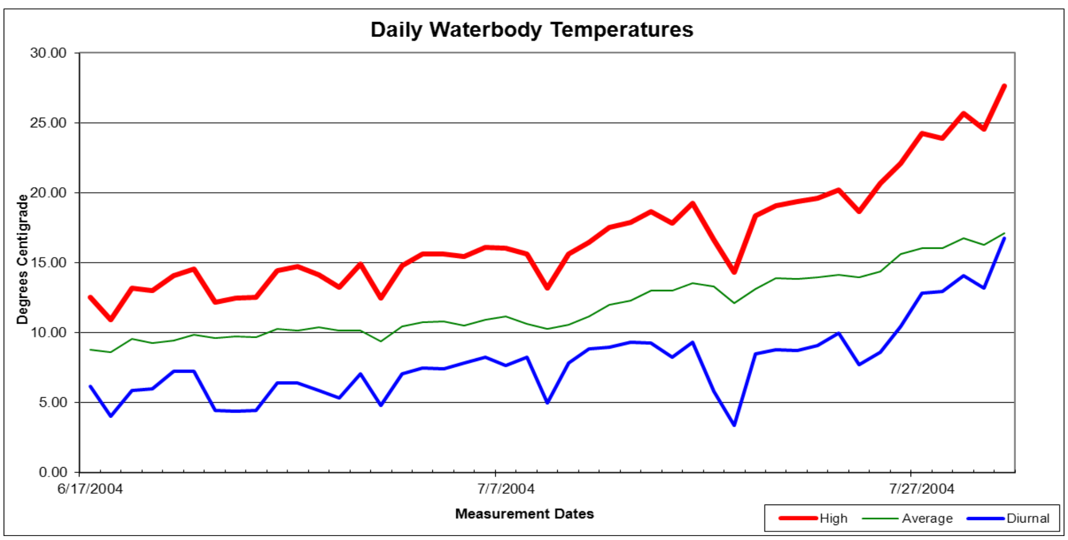


Figure RIPN-2: WF Red Canyon temperature information, 2004
(MDMT = 27.6 °C and MDT = 17.1°C)



Pasture 2 – Carter Spring

According to the NHD, pasture 2 contains approximately 0.25 miles of perennial streams (Beaver Creek), 39.75 miles of intermittent/ephemeral streams, and five spring/seeps. Because the NHD underestimates the total number of springs/seeps, the 2011 NAIP was used to supplement the springs identified, as well as the estimated acreage of the associated riparian-wetland areas (14.75 acres). More than 5.0 miles of Beaver and Carter Creeks were assessed in 1999 using the PFC protocol, and all were FAR (Map RNGE-1). All five of the springs have been assessed; three are FAR, and two are properly functioning. Four of the springs were assessed in 2002 and one of the unnamed springs was visited in 2009.

The reaches of stream that support riparian-wetland vegetation and the spring/seeps that are not protected from livestock are not functioning properly in terms of the resiliency that allow a riparian area to hold together during a high-flow event, which then allows the area to provide desired values (i.e., floodplain development, filter sediment, and wildlife habitat). Some of the specific issues identified associated with the riparian-wetland areas include a lack of riparian-wetland vegetation that stabilize the banks, heavy browse on woody species, and a high percentage of bare ground. Those issues associated with stream channels include over-widened stream channels and an excess of sediment deposits.

Greenline transects were established on both Carter and Beaver Creeks in pasture 2. The values recorded for the portion of the reach that had unstable stream banks were 59 percent and 51 percent, respectively.

Both Beaver Creek and Carter Creek occur within pasture 2 and are on the IDEQ 303(d) list (Map RNGE-1). BLM has not monitored water temperature or bacterial levels in pasture 2.

Pasture 3 – Red Basin
According to the NHD, pasture 3 contains approximately 1.1 miles of perennial streams, 34.7 miles of intermittent/ephemeral streams, and one spring/seep. Because the NHD underestimates the total number of springs/seeps, the 2011 NAIP was used to supplement the springs identified, as well as the estimated acreage of the associated riparian-wetland areas (48.0 acres). Five reaches of Red Basin have been assessed using the PFC protocol: 1.15 miles are FAR and 4.17 miles are functioning properly (Map RNGE-1). The lower three reaches traverse the boundary of the allotment/ pasture and fall within an area that is technically excluded from livestock. There is evidence that livestock occasionally access these streams, and they were included here for reference. More than 8 miles of Red Canyon Creek that traverse the pasture were not assessed but are likely functioning properly because they are inaccessible to livestock. Rattlesnake Spring was assessed FAR in 2002 and was properly functioning in 2009.

The reaches of stream and the spring/seep that support riparian-wetland vegetation and that are accessible to livestock are not functioning properly in terms of the resiliency that allow a riparian area to hold together during a high-flow event. Some of the specific issues identified that are associated with riparian-wetland function include a lack of riparian-wetland vegetation that stabilizes the banks and upland species in what would be the riparian zone. Issues identified that are associated more specifically with the stream channel function include the reach of Red Basin that is not functioning properly and is laterally unstable (wide and shallow channel) with a shrinking riparian area. Additionally, there is a lack of bank-stabilizing riparian plant species (especially willows (*Salix spp.*)). Much of the stream channel and floodplain of Red Basin is well-armored with rock. The bank and channel stability of this stream (about 3 miles) is a function of rock armoring rather than that of riparian vegetation.

One greenline transect was established on Red Canyon Creek and 5 percent of the stream was unstable.

Pasture 4 – Lambert Table
According to the NHD, pasture 4 contains approximately 16.75 miles of intermittent/ephemeral streams. The streams in pasture 4 support intermittent/ephemeral flows and very little riparian vegetation and thus have not been assessed using the PFC protocol.

Pasture 5 – Horse
According to the NHD, pasture 5 contains approximately 0.4 miles of perennial stream, 9.0 miles of intermittent/ephemeral stream and five springs (4.8 acres).

The streams in pasture 5 support intermittent/ephemeral flows and very little riparian vegetation, and thus have not been assessed using the PFC protocol. The EF of Red Canyon flows along the border between pasture 1 and 5 and was discussed under pasture 1 above. Three of the five springs have been assessed using the PFC protocol: two are FAR and one is NF. One of the FAR springs was re-assessed in 2009 and was functioning properly.

Pasture 6 – Between-the-Canyons

According to the NHD, pasture 6 contains approximately 14.9 miles of perennial streams, 13.0 miles of intermittent streams, and 14 spring-seeps (12.65 acres). More than 17 miles of the streams have been assessed using the PFC protocol; approximately 7.0 miles are in proper functioning condition[44] and about 10 miles are FAR. Six of the springs have been assessed; three are NF, one is FAR, and two are properly functioning (Tables RIPN-3 and -4, Map RNGE-1). One of the six springs (East Spring) was assessed NF in 2003 and re-assessed in PFC in 2009, indicating an upward trend. In addition, two reaches of stream have been monitored using the Multiple Indicator Monitoring (MIM) method (Tables RIPN-5 and -6), and two greenline transects were established in 2004. Both the MIM sites and the greenline transects were established on the EF and the WF of Red Canyon.

The reaches of stream that are accessible to livestock and the springs/seeps that are not protected from livestock are FAR or are not functioning properly, in terms of the resiliency that allows a riparian area to hold together during a high-flow event, which then provides desired values (i.e., floodplain development, sediment filtration, and wildlife habitat) to the area. Some of the specific issues identified that are associated with riparian-wetland areas included a lack of bank stabilizing species of riparian-wetland vegetation, deeply incised stream channels, a high percentage of bare ground, and a general loss of soil. Issues associated specifically with the stream channels included over-widening of stream channels, deeply incised channels, laterally and vertically (presence of headcuts) unstable channels, shrinking riparian areas, and upland species appearing in the riparian areas.

Information collected at the MIM sites had similar results. Both reaches have a lack of hydric vegetation, they are not meeting the stream bank stability criteria, and the vegetation-resistance erosion index is low to moderate.

Greenline transects established on the EF and the WF of Red Canyon documented bank stability and vegetation information. The values for the portions of the stream reach that were unvegetated and unstable were 10 and 18 percent respectively.

Table RIPN-5: Castlehead-Lambert allotment- streams that have been assessed and their condition rating

Stream Name	Pasture	Reach Length (miles)	Condition
Beaver Creek	2	0.44	FAR
Beaver Creek	2	0.91	FAR
Beaver Creek	2	0.99	FAR
Beaver Creek	2	1.12	FAR
Carter Creek	2	0.65	FAR
Carter Creek	2	0.94	FAR
Castle Creek	1 & 6	0.28	FAR
Castle Creek	1 & 6	0.89	PFC
Castle Creek, Deep Creek Trib	1 & 6	0.64	FAR
Castle Creek, Deep Creek Trib	1 & 6	0.00	FAR

[44] PFC indicates a riparian-wetland area has adequate vegetation, landform, or large woody debris present to dissipate stream energy, filter sediment, aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.

Stream Name	Pasture	Reach Length (miles)	Condition
EF Red Canyon Creek	1 & 6	1.10	FAR
EF Red Canyon Creek	1 & 6	0.86	PFC
EF Red Canyon Creek	1 & 6	0.75	FAR
EF Red Canyon Creek	1 & 6	0.93	FAR
EF Red Canyon Creek	1 & 6	1.15	FAR
EF Red Canyon Creek	1 & 6	0.68	FAR
Little Smith Creek	1 & 6	0.64	FAR
Moonshine Spring Creek	1 & 6	0.76	FAR
Red Canyon Creek	3	0.73	PFC
Red Canyon Creek	3	1.30	PFC
Red Canyon Creek	3	0.96	PFC
Red Canyon Creek	3	1.18	PFC
Red Canyon Creek	3	1.10	FAR
WF Red Canyon Creek	1 & 6	1.27	PFC
WF Red Canyon Creek	1 & 6	1.18	FAR
WF Red Canyon Creek	1 & 6	0.34	PFC
WF Red Canyon Creek	1 & 6	0.63	PFC
WF Red Canyon Creek	1 & 6	0.57	PFC
WF Red Canyon Creek	1 & 6	0.81	PFC
WF Red Canyon Creek	1 & 6	0.76	FAR

Table RIPN-6: Castlehead-Lambert allotment springs that have been assessed and their functioning condition

Spring Name	Pasture	Developed	Condition 1	Date 1	Condition 2	Date 2	Acres[45]
Wonder Spring	1	Y	FAR	2002	PFC	2009	1
Beaver Creek Springs	1	N			PFC	2009	3
Boggy Spring	1	N	NF	2002	PFC	2009	1
Buckskin Spring	1	N			PFC	2009	1
Castlehead Spring	1	Y			PFC	2009	2
Moonshine Spring	1	N			PFC	2009	3
Unnamed Spring	1	Y	NF	2002			<0.25
Unnamed Spring	1	N	NF	2002			
Carter Spring	2	N	PFC/FAR	2002	FAR	2009	1
Springs	2	N			FAR	2009	1
Unnamed Spring	2	Y	PFC	2002			0.5
Unnamed Spring	2	N	FAR	2002			0.25
Rattlesnake Spring	5	Y	FAR	2002	PFC	2009	1

[45] Acres estimated during field assessments

Spring Name	Pasture	Developed	Condition 1	Date 1	Condition 2	Date 2	Acres[45]
Craig Springs	5	Y	FAR	2002	PFC	2009	1
Unnamed Spring	5	Y	FAR	2002			<0.25
Roaring Spring	5	N	NF	2002			0.25
East Spring	6	N	NF	2002	PFC	2009	1
Rock Spring	6	Y			PFC	2009	1
Unnamed Spring	6	N	FAR	2002			1
Craig Camp Spring	6	N	NF	2002			<0.25
Unnamed Spring	6	N	NF	2002			1

Table RIPN-7: Multiple Indicator Monitoring capability groups

Greenline Ecological Status Rating		Vegetation-Erosion Resistance Status Rating		Site Wetland Status Rating	
Summary Value	**Condition Rating**	**Summary Value**	**Condition Rating**	**Summary Value**	**Condition Rating**
0-15	Very Early	0-2	Very Low	0-15	Very Poor
16-40	Early	3-4	Low	16-40	Poor
41-60	Mid	5-6	Moderate	41-60	Fair
61-85	Late	7-8	High	61-85	Good
85+	PNC	9-10	Very High	85+	Very Good

Tables RIPN-8a and 8b: Castlehead-Lambert allotment Multiple Indicator Monitoring (MIM) site capability groups and stream metrics

Table RIPN-8a

Stream Reach	Greenline Ecological Status Summary Value/Rating	Vegetation-Erosion Resistance Summary Value/Rating	Site Wetland Status Summary Value/Rating
Castle Creek	88 (PNC)	6.88 (Moderate)	67 (Good)
EF Red Canyon	76 (Late)	6.42 (Moderate)	64 (Good)
WF Red Canyon	2 (Very Early)	4.2 (Low)	10 (Very Poor)
Little Smith Creek	37 (Early)	5.0 (Moderate)	45 (Fair)

Table RIPN-8b

	Stream Metrics						Woody Species Regeneration			
	Median SH (inches)	***Mean SH (inches)***	***Bank Alteration (%)***	***Woody Use (%)***	***Bank Stability (%)***	***Bank Cover (%)***	***Saplings & Young (%)***	***Mature (%)***	***Dead (%)***	***Hydric Species (%)***
Castle Creek	14.0	12.5	5%	-	73%	95%	5%	86%	9%	64%
EF Red Canyon	12.0	120.0	2%	6.3%	99%	95%	30%	70%	0%	54%
WF Red Canyon	8.0	9.3	0%	-	76%	100%	-	-	-	4%
Little Smith Creek	8.0	8.8	4%	-	71%	86%	15%	83%	3%	34%

3.4.4.2 Direct and Indirect Effects

Introduction

See the Common to All Allotments Section 3.3.1.4 for general introductory information common for the impact analyses for all allotments and all alternatives.

The streams within the Castlehead-Lambert allotment were stratified in order to effectively analyze the impacts from livestock grazing among the alternatives. The stratification process aggregated the allotment area and ultimately the stream reaches within the areas where assessments and monitoring have occurred.

The primary spatial datasets used to create the strata present within the allotment area include Omernik's Level IV ecoregions and three ecologically significant levels of stream gradient (0- 2.0 percent, 2.0-4.0 percent, and >4.0 percent). Methods used to define the ecoregions are explained in (Omernik, 1995) and (Omernik, 2004). Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. The mapped regions are based on the premise that ecological regions can be identified through the analysis of patterns of biotic and abiotic phenomena, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another. The Castlehead-Lambert allotment falls within three ecoregions: Dissected High Lava Plateau (DHLP), Owyhee Uplands and Canyons (OU&C), and Semiarid Uplands (SU) (see descriptions under Wildlife Section 3.3.1.5 above). When the three ecoregions are combined with the three gradient levels, there are nine strata to consider (Table RIPN-9).

The ability of a given stream to withstand grazing management stress depends on its inherent level of natural stress (i.e., the streams potential for hydric vegetation and stream bank stability) (Elmore W. , 1994). Therefore, the groups of streams within each of the nine strata were assessed for available information regarding the potential natural vegetation (PNV), the current dominant community type (CT), and the inherent stability (Table RIPN-10). The summary of this information will facilitate the impact analyses among grazing alternatives discussed below.

Tables RIPN-9a and 9b: Total miles of perennial and intermittent streams within each stratum and pasture on BLM lands within the Castlehead-Lambert allotment

Table RIPN-9a

Pasture	Flow Type	Stream Name	Gradient	Dissected High Lava Plateau	Owyhee Uplands and Canyons	Semiarid Uplands	Total
1	**Intermittent**	Castle Creek	>4 %			0.71	0.71
		Unnamed Creek	>4 %		2.39	4.07	6.46
	Perennial	Castle Creek	2-4 %			0.26	0.26
			>4 %			0.57	0.57
		Little Smith Creek	>4 %		0.61		0.61
		Unnamed Creek	0-2 %			0.05	0.05
2	**Intermittent**	Beaver Creek	2-4 %		1.35		1.35
			>4 %		2.18	1.04	3.22
		Carter Creek	2-4 %		5.38		5.38
		Trap Creek	>4 %		1.52		1.52
		Unnamed Creek	0-2 %		0.15		0.15
			2-4 %		11.32	0.14	11.46
			>4 %		5.96	5.70	11.66
	Perennial	Unnamed Creek	>4 %			0.54	0.54
3	**Intermittent**	Red Basin Creek	0-2 %	5.45			5.45
			2-4 %	0.90	1.51		2.40
			>4 %	0.62			0.62
		Unnamed Creek	0-2 %	1.15	0.25		1.40
			2-4 %	4.76	5.41		10.17
			>4 %	4.79	4.39		9.18
	Perennial	Red Canyon	0-2 %	0.16			0.16
			2-4 %	0.97			0.97
			>4 %	0.11			0.11
4	**Intermittent**	Porcupine Creek	0-2 %	1.61			1.61
			2-4 %	0.18			0.18
		Unnamed Creek	0-2 %	3.88			3.88
			2-4 %	2.90			2.90
			>4 %	17.40			17.40
5	**Intermittent**	Unnamed Creek	0-2%		0.03		0.03
			2-4%		1.65		1.65
			>4%		5.49		5.49

Pasture	Flow Type	Stream Name	Gradient	Dissected High Lava Plateau	Owyhee Uplands and Canyons	Semiarid Uplands	Total
	Perennial	Unnamed Creek	2-4%		0.13		0.13
			>4%		0.50		0.50
6	**Intermittent**	Unnamed Creek	>4%	0.10	3.97	8.94	13.01
	Perennial	EF Red Canyon	>4%		0.64	2.26	2.90
		WF Red Canyon	2-4%			0.28	0.28
			>4%		0.32	3.15	3.47
		Unnamed Creek	0-2%		0.54	0.32	0.86
			2-4%		3.37	2.33	5.70
			>4%	0.32	0.44	1.20	1.64

Table RIPN-9b: Total Miles within each Pasture and Strata

Pasture	Gradient	Dissected High Lava Plateau	Owyhee Uplands and Canyons	Semiarid Uplands	Total
1	0-2%			0.05	0.05
	2-4%			0.26	0.26
	>4%		3.00	6.53	9.53
2	2-4%		0.15		0.15
	>4%		18.05	0.14	18.19
3	0-2%	6.82	0.25		7.07
	2-4%	6.63	6.91		13.54
	>4%	5.52	4.39		9.91
4	0-2%	5.65			5.65
	2-4%	3.12			3.12
	>4%	17.45			17.45
5	0-2%		0.03		0.03
	2-4%		1.78		1.78
	>4%		6.02		6.02
6	0-2%		0.54	0.32	0.86
	2-4%		3.37	2.61	5.98
	>4%	0.42	5.05	15.56	21.02
Grand Totals		**45.29**	**59.18**	**32.74**	**137.21**

Table RIPN-10: Available information on the Potential Natural Vegetation, Current Community Type, and Inherent Stability of groups of streams within the Castlehead-Lambert allotment

Strata[46]	PNV[47]	Inherent Stability[48]	Current CT[49]	Inherent Stability
DHLP 0-2%	SALLAS	80	SALLAS SALEXI ARTTRI/DRY GRAM	80 75
DHLP 2-4%	SALLAS	80	SALLAS SALEXI ARTTRI/DRY GRAM	80 75
DHLP >4%	SALLEM	85	SALLEM ROSWOO	85
OU&C 0-2%	SALLAS	80	ROSWOO SALLAS	 80
OU&C 2-4%	SALEXI	75	JUNOCC POAPRA SALEXI JUNBAL	 40 75 60
OU&C >4%	SALLEM	85	POAPRA ROSWOO	40
SU 0-2%	SALLEM	85	SALLEM JUNOCC	80
SU 2-4%	SALLUT	85	SALLUT BETOCC	 95
SU >4%	SALLEM	85	SALLEM JUNOCC POAPRA	80 40

3.4.4.3 Direct and Indirect Effects

3.4.4.3.1 Alternative 1 Effects

The livestock grazing that has occurred under Alternative 1 (for details, see sections 2.1 and 2.8.1.1) has led to the current condition of the riparian areas and water quality; thus, it will serve as the baseline for comparison to the other alternatives. Under this alternative, the riparian pastures 1 and 6 would be grazed every year during the riparian area growing season. Because upland grasses are often dry and temperatures are warmer during the summer months, livestock make disproportionate use of riparian areas and riparian herbaceous vegetation is preferred (Powell, Cameron, & Newman, 2000). Once the riparian herbaceous vegetation is used to a level ranging from 45 to 90 percent, willows and other riparian shrubs are browsed at various levels. Under this prescription, riparian shrubs could lose 3 years of growth and gain only 2 years during a 3-year cycle. This is especially critical in areas where shrubs are in the primary stages of establishment (Elmore & Kauffman, 1994). If both the herbaceous and shrub cover decline, a compounding set of impacts can occur: because shade has been reduced, water temperatures increase; vegetative structure and cover for fish and wildlife is lost; stream bank stability decreases

[46] Ecoregion & Gradient Level Combination: DHLP= Dissected High Lava Plateau; OU&C = Owyhee Uplands & Canyons; SU = Semiarid Uplands;
[47] Potential Natural Vegetation and Current Community Type is from Riparian Proper Functioning Condition Inventory; 1996-2002; conducted by Ecological Solutions Group LLC for the OFO BLM
[48] From (Bengeyfield & Svoboda, 1998).
[49] SALLAS= Whiplash Willow; SALEXI= Coyote Willow; ARTTRI= Big Sagebrush; SALLEM=Lemon's Willow; ROSWOO= Wood's Rose; JUNOCC= Western Juniper; POAPRO= Kentucky Bluegrass; JUNBAL= Baltic Rush; SALLUT= Yellow Willow; BETOCC= Water Birch

increasing erosion, sediment and stream velocity; a loss of hydric, deep-rooted species that aid in bank stability occurs; and riparian plant species may be replaced by weedy and/or upland plant species (Green & Kauffman, 1995), (Belsky, Matzke, & Uselman, 1999).

Additionally, when riparian areas are open to grazing every year during the growing season, livestock congregate close to water where it is cooler and the forage is more palatable (Bryant, 1982), (Smith, Rodgers, Dodd, & Skinner, 1992), (Liggins, 1999). Once livestock have congregated along the floodplain, in riparian-wetland areas, and in the stream channel, further impacts associated with stream bank trampling (Kauffman, Krueger, & Vavra, 1984), soil compaction (Marlow & Pogacnik, 1985), and water quality (Taylor, Gillman, & Pendretti, 1989) occur (Table RIPN-2). In-stream trampling, disturbance and erosion from denuded banks, reduced sediment trapping by vegetation, loss of bank stability, and increased peak flows lead to reduced habitat quality for both fish and aquatic species, reduced infiltration, and lowered water tables (Stevens, McArthur, & Davis, 1992). An increase in soil compaction created by congregated livestock (especially during spring grazing) causes an increase in erosion, decreased water infiltration rates and more runoff, reduced plant productivity, and thus less vegetative cover (Clary, 1995). Finally, impacts associated with water quality include a potential increase in nutrient concentrations, bacteria, sediment, and water temperatures. Direct fecal deposition into and near water, runoff from disturbed stream banks, and hoof churn-up of contaminated sediments increase nutrient and bacteria concentrations (Taylor, Gillman, & Pendretti, 1989).

Alternative 1 would manage the riparian pasture 2 under a 3-year rest/rotation system. During 2 of the 3 years, the pasture would be grazed during the spring or during the growing season. When used during the growing season, the impacts described above for pastures 1 and 6 apply. However, when the pasture is used only during the spring, herbaceous plant species are foraged preferentially because they are green and growing, allowing shrubs to incur less browse. Also, during the spring, cooler temperatures and green upland forage disperse livestock, decreasing the compounding impacts associated with congregated livestock (disproportionate and overuse of both herbaceous and woody plant species, floodplain and in-stream trampling, soil compaction, and water quality). Additionally, the pasture would be rested from grazing 1 in every 3 years, which promotes plant vigor, seed production, seedling establishment, root production, and litter accumulation (Elmore W. , 1994).

Under this alternative, the mileage of perennial and intermittent streams and the springs that would be impacted as described under the various grazing systems and within each of the pastures and strata are shown in Table RIPN-9. The impacts would vary based on the variables that determine the strata (i.e., stream gradient, annual precipitation, valley type), the potential and current vegetation community type, and the inherent stability of the system. Although each area is unique in its particular setting (stream characteristics, valley bottom type and soils, potential vegetation, relationship to upland topography and vegetation) and thus its ability to withstand impacts, in general, under Alternative 1, approximately 17.5 miles of perennial stream, 9.5 miles of intermittent stream, and 37 acres of riparian-wetland area associated with springs/seeps that occur within pastures 1 and 6 would be affected by the impacts associated with summer grazing as described above. Within pasture 2, approximately 1.75 miles of perennial streams, 90 miles of intermittent streams, and about 67.5 acres of wetland area associated with the springs would be impacted by both spring and summer grazing as described above.

If Alternative 1 were implemented, the riparian and water resource issues and associated impacts would remain the same (and could increase) as the current condition. The resources would continue to be degraded, and Rangeland Health Standards 2, 3 and 7 would not be met. Additionally, the ORMP objective to maintain or improve riparian-wetland areas to attain PFC for all lotic and lentic systems would not be achievable. Similarly, the ORMP objective to meet or exceed State water quality standards would not be attained.

3.4.4.3.2 Alternative 2 Effects

The biggest difference between Alternative 2 (for details, see sections 2.2 and 2.8.1.2) and Alternative 1 is that the riparian pastures (1, 2, 5, and 6) would be grazed during the spring and summer. Consequently, the riparian-wetland areas and streams would incur grazing during the critical parts of the riparian area growing period and the system provides no rest, usually resulting in heavy use of both the herbaceous and woody riparian plant species (Elmore W. , 1994). Furthermore, as described in detail under Alternative 1 effects section above, concentrated livestock in the riparian areas that occur disproportionately during the dry, warm summer months negatively impacts water quality, stream channel morphology, riparian soils, and local aquatic and terrestrial species (Roche, 2003).

The implementation of Alternative 2 would have similar results and would impact the same mileage of streams and acres of riparian-wetland areas as those described for Alternative 1. The riparian and water resource condition would either remain as it is currently (see the Affected Environment section 3.4.4.1) or would degrade further. Additionally, the rangeland health standards (2, 3, and 7) associated with the riparian and water resources would not be attainable. Similarly, both the riparian and the water quality ORMP objectives would not be achievable.

3.4.4.3.3 Alternative 3 Effects

Implementation of Alternative 3 (for details, see Sections 2.3 and 2.8.1.3) would include performance-based terms and conditions that were developed for the protection of both the lotic and the lentic riparian-wetland areas. The term and condition specific to riparian-wetland areas associated with Alternative 3 (T&C #13) includes measurements for herbaceous stubble height, woody browse, and alteration caused by livestock within the riparian-wetland areas and along the stream channels. Compliance with the short-term indicators of conserving an herbaceous stubble height of at least 6 inches and maintaining a riparian shrub use level less than 30 percent would minimize the removal of stabilizing, hydric species allowing the lotic/lentic systems to withstand high flow events. Since the banks would be stable and vegetated and the vegetation within the spring areas would increase, erosion would decrease and aquatic species habitat would improve. Additionally, compliance with the stream bank alteration term and condition would lessen the impacts associated with the shearing and compaction of riparian-wetland soils caused by livestock congregating in riparian areas and trampling stream channels, including increased erosion and stream temperatures, lowered water table and loss of hydric vegetation – all decreasing aquatic species habitat.

Alternative 3 would allow the riparian and water resources to incur fewer of the impacts described. Specifically, compliance with the herbaceous stubble height and woody browse standards would minimize the direct removal of vegetation and the compounding impacts (i.e., reduced water infiltration, shading, and bank stability; increased runoff, water velocity, erosion, sediment load, and stream temperatures; lowered water table; and impaired fish and aquatic habitat) would be reduced. Compliance with the stream bank alteration standard would lessen the floodplain and in-stream trampling impacts and associated resource consequences. For example, for those areas where it has been determined that the steam’s inherent stability (Table RIPN-10) is able to withstand some level of stream bank alteration, the effects of livestock on the bank shape and stability would be maintained at a level that would allow the stream to withstand the forces of moving water during high flows. The direct sloughing and shearing of stream banks would improve, and the erosion rates, and thus sedimentation, would decrease. The secondary impacts associated with stream bank alteration in the form of increased channel widths and depths, a change in the composition of stream bed materials, a reduction in quality and quantity of stream bank undercuts and pools, would also be either stabilized or improved (Belsky, Matzke, & Uselman, 1999), (Powell, Cameron, & Newman, 2000).

The implementation of Alternative 3 would require consistent and continuous collaboration and response from both the livestock operators and the agency personnel responsible for managing the allotment. Leonard and Karl (1995) contend that both livestock grazing and stream system improvement can be accomplished with an increased emphasis on compliance to suitable grazing systems and practices. Overall, the implementation of this alternative would result in an improvement for the riparian and water resource through compliance with the associated terms and conditions (#13).

Overall, the implementation of and compliance with the terms and conditions would allow the water and riparian resources to make progress toward the attainment of the long-term indicators (i.e., appropriate channel widths and depths and stable banks) and resource objectives. Specifically, Rangeland Health Standards 2, 3 and 7 would be met and the ORMP objective to maintain or improve riparian-wetland areas to attain PFC for all lotic and lentic systems would be achievable. Similarly, the ORMP objective to meet or exceed State water quality standards would be attained.

3.4.4.3.4 Alternative 4 Effects

Under Alternative 4 (for details, see Sections 2.4 and 2.8.1.4), in the pastures that contain the riparian and water resources (1, 2, 5, and 6), livestock grazing would not occur during the summer months (July to September), eliminating the impacts and resource consequences associated with use during summer season of use (see Alternative 1in Section 3.4.4.3.1 and Table RIPN-2). The elimination of grazing during the critical riparian area growing period would promote plant vigor, seed and root production, and seedling establishment (Elmore & Kauffman, 1994) because the removal of riparian vegetation and livestock trampling would be minimized. Furthermore, the associated secondary impacts, including sedimentation, increased water temperatures, lowered water table, and decreased suitability of aquatic species habitat, would also be reduced.

Alternative 4 would allow for spring grazing in pasture 2 and both spring and fall grazing in pastures 1 and 6. For both years of the 2-year cycle, pasture 2 would be grazed only during the spring or early growing season, providing rest during much of the riparian area growing period, thereby promoting seed and root production (Powell, Cameron, & Newman, 2000). Riparian vegetation would benefit, since regrowth occurs every year and woody plant species browse is minimized. Essentially, Alternative 4 would benefit the riparian system because both the direct impacts to riparian areas (i.e., vegetation removal and livestock trampling), as well as the secondary impacts (i.e., detrimental changes in stream morphology, increased erosion and sediment loads, decreased water quality, and impaired fish and aquatic habitat) would be reduced. However, Alternative 4 would have some impacts on riparian areas because the alternative allows early-season grazing during a time when soils are typically wet. The static load of a cattle hoof is reported to range from 2.8 to 10.9 kg/cm^2 and can increase by two to four times when the animal travels (Powell, Cameron, & Newman, 2000); thus, when the soils are saturated, the physical damage to the stream banks increase. The increased soil compaction could cause an increase in erosion and sediment loading that would impair water quality and thus fish and aquatic habitat. Despite the riparian impacts associated with early-season use, overall this alternative would allow the riparian area condition to improve.

Pastures 1 and 6 would be grazed alternately during the spring of year one and during the fall of the second year; the impacts associated with spring grazing would be the same as described above. The addition of the fall grazing period would increase the occurrence of browse on the woody riparian species because both upland and riparian herbaceous forage has dried and/or been used (Elmore W. , 1994). The amount of time available for both herbaceous and woody species regrowth after livestock are removed would be reduced because grazing would occur through the end of September. However, this system of grazing could be effective because in the fall months both stream bank and upland temperatures are often cool enough to discourage animals from congregating in the riparian areas (Bellows, 2003).

Overall, the implementation of Alternative 4, which prohibits summer/growing season grazing in the riparian pastures, would reduce the impacts on the riparian and water resources. Specifically, about 40 miles of intermittent streams and 14.75 acres of riparian-wetland areas associated with springs within pasture 2 would incur only those impacts associated with spring grazing. Within pastures 1 and 6, approximately 17.6 miles of perennial, 20 miles of intermittent, and 36.7 acres of spring riparian area would incur those impacts associated with spring and fall grazing during alternate years. Under this alternative, there would be progress toward meeting the rangeland health standards associated with the water and riparian resources (Standards 2, 3, and 7), and in the long term, the standards would be met. Additionally, the ORMP objective to maintain or improve riparian-wetland areas to attain PFC for all lotic and lentic systems would be achievable. Similarly, the ORMP objective to meet or exceed State water quality standards would be attained.

3.4.4.3.5 Alternative 5 Effects

Under Alternative 5 (for details, see Sections 2.5 and 2.8.1.5), the elimination of grazing for a period of 10 years would restore the riparian ecosystem because the rest from livestock grazing would allow for the recovery of the stream bank and a functional riparian plant community. Information is lacking on the length of rest required for recovery of riparian vegetation; however, shrubs often require longer periods of recovery than herbaceous vegetation (Powell, Cameron, & Newman, 2000). Improvement in stream channel form and function would only occur if the channel is at a stage where improvement is possible; for example, downcut systems would need to reach a new base level and widening would have to occur to allow vegetation establishment sufficient to resist higher flows (Leonard & Karl, 1995). Recovery would also be dependent on the levels of degradation and the climatic variables (Bellows, 2003). Since the allotment occurs in an arid region and the riparian areas accessible to livestock in pastures 1, 2, 5, and 6 are seriously degraded, 10 years of rest would not generate riparian-wetland areas that historically existed. However, research has found that in ungrazed areas, streams experienced decreased widths and depths (Clary, 1999), vegetation cover increased two-fold, stream bank stability increased by 50 percent (Scrimgeour and Kendall 2002), and stream bank erosion was 3.3 times less in an ungrazed area compared to an area grazed at a moderate stocking rate and level of use (Kauffman, 1982).

The implementation of Alternative 5 would have the greatest benefit for the riparian and water resources because the riparian ecosystem would recover most of the structural and functional diversity that occurs within the allotment. Thus, the allotment would make progress toward meeting the water and riparian standards and would meet the Standards (2, 3, and 7) associated with the water and riparian resources. Additionally, the ORMP objective to maintain or improve riparian-wetland areas to attain PFC for all lotic and lentic systems would be achievable. Similarly, the ORMP objective to meet or exceed State water quality standards would be attained.

3.4.4.4 Cumulative Effects

Introduction and Scope

A cumulative effect is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative impacts focus on the aggregate effects of the past, present, and reasonably foreseeable future actions. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within 3 years.

The water and riparian resource CIAA was set to the IDEQ 5th field HUCs (watersheds) (Table RIPN-11, Map CMLV-1) that incorporate and extend beyond the allotment boundary. The watersheds are comprised of assessment units that were established to incorporate groups of similar streams with the same stream order, and with similar land use practices, ownership, or land management. The watersheds that make up the CIAA include Deep Creek, the Headwaters of Deep Creek, and the Red Canyon/ Owyhee River. The BLM chose this CIAA because the direct and indirect effects of grazing management on riparian and watershed resources, as well as on specific impacts such as stream sediment and water temperature, can be experienced within these IDEQ 5th field HUCs. Outside of this area, however, direct and indirect effects of the grazing scheme will not be experienced and/or will be too small to create identifiable cumulative effects.

Table RIPN-11: IDEQ 4th and 5th field hydrologic unit codes for the Castlehead-Lambert allotment

4th Field HUC (sub basin)	5th Field HUC (watershed)	Watershed Acres
Upper Owyhee	Deep Creek	74,912
	Headwaters Deep Creek	98,052
	Red Canyon/ Owyhee River	93,055

Cumulative Impact Area Activities
The figures in the following table of past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts were calculated using BLM GIS data. The data used represent the best available information and the calculations based on the data are approximate.

Table RIPN-12: Past, present, and foreseeable actions within the Castlehead-Lambert allotment CIAA

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing	22 active BLM allotments	Permits will be renewed/modified as they expire: 4 to be processed by 2015
Wildfire	82,663 acres (between 1985-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	28,378 acres (1952-2011)	9,750 acres
Noxious Weed Presence	47 infestations covering ~ 40 acres	<10 acres/year new weed infestation anticipated
Agriculture	57 acres	None
Roads	281.5 miles	None

Livestock grazing is the dominant land use activity in the area, and almost all of the land area is managed for grazing. In the 1990s, BLM initiated a series of range reform activities in response to poor range conditions. Since the Standards were implemented in 1997, Idaho BLM has reviewed and issued grazing permits on about half of the available allotments in the general area. The final decisions for these allotments have been implemented to make significant progress toward meeting Standards. Currently, the allotments in the area are primarily grazed throughout the spring and summer. Additionally, a variety of range improvement projects such as spring developments, fences, cattle guards, and troughs have been implemented across the landscape to aid in livestock grazing management. Allotments that occur completely or in part within the water-riparian resource CIAA and their acreage are shown in table RIPN-

13. The allotments in the analysis area are in various stages of the 10-year cycle, and as expiration dates approach, each allotment will be evaluated for rangeland health and progress toward meeting Standards prior to the authorization of a new permit. Overall, past and current grazing in the CIAA has had an adverse effect on riparian and watershed resources because grazing has primarily occurred during the spring and summer months when the riparian area soil and vegetation are most vulnerable. Reasonably foreseeable future grazing is expected to improve the condition of the riparian and watershed at a minimum to make significant progress towards meeting the Idaho Rangeland Health Standards.

Table RIPN-13: Grazing allotments within the Castlehead-Lambert allotment CIAA, acres, stream mileage within each, and their permit expiration data

Allotment #	Allotment Name	Acres	Perennial Miles	Intermittent Miles	Year Permit Expires
00450	Swisher Springs	3,851	0	28.4	2016
00520	Indian Meadows	1,298	0	7.6	2013
00539	Trout Springs	8,199	15.6	13.5	2017
00540	Bull Basin	23,224	27.2	64.5	2022
00547	Pleasant Valley	1,667	2.7	1.4	2022
00548	Nickel Creek	65,504	35.2	223.6	2014
00577	Bogus Creek FFR	1,128	0	2.3	2021
00584	Garat	18,731	0	46.3	2017
00587	Lone Tree	18	0	0	2017
00599	Burghardt	19,358	9.7	76.7	2020
00634	Castlehead-Lambert	46,049	19.35	120.3	2013
00601	Louisa Creek	45	0	0	2017
00606	Moore FFR	15	0	0	2013
00623	Bull Basin FFR	240	2.0	0.7	2017
00625	Burghardt FFR	3,634	1.0	6.2	2022
00637	Swisher FFR	762	0.5	4.9	2020
00657	Nickel Creek FFR	7,858	7.7	14.1	2014
00801	West Castle Creek	980	0	2.9	2019
00803	Big Springs	39,480	18.8	127.9	2019
00804	Bennett	9,156	0	4.6	2017
00891	Black FFR	1,313	0	0.7	2019
00892	Nahas FFR	1,968	0.1	1.7	2022

Wildfire records maintained by the Idaho BLM State Office indicate that approximately 82,663 acres (31 percent of CIAA) burned between 1985 and 2011within the analysis area. Wildfires have caused disturbances within the watersheds, increasing the potential for overland flows, soil erosion, and increased stream sedimentation. When wildfires have burned and removed riparian vegetation, the compounding impacts such as increased stream temperatures, loss of water infiltration, decreased bank stability, and impaired aquatic species habitat have occurred within the CIAA.

Vegetation treatments such as prescribed fires, juniper, conifer, and sagebrush control, and invasive species control have had limited effects within the allotment. Similarly, the effects of vegetation treatments within the CIAA have been negligible due to the localized and small areas that have been treated.

There are about 57 acres of agriculture land and 47 acres of weed infestations documented within the analysis area. The small area impacted by these activities has had no measureable effect on the water-riparian resource either in the Castlehead-Lambert allotment or the larger analysis area because the areas are too small to be meaningful in the CIAA.

Increasing population in the Treasure Valley and an increasing popularity of off-highway vehicles (OHVs) are creating additional pressures on the water-riparian resources from recreation uses. The recent Wilderness and Wild and Scenic River designation is also expected to increase recreation use of this general area. There are approximately 281 miles of unpaved roads traversing the analysis area. The streams that occur within the area are crossed by roads at an estimated 157 different places. Depending on the amount of traffic that occurs on a given road, the stream crossings increase erosion and sedimentation, and disturb vegetation and aquatic species both on a site specific scale as well as downstream of the crossings.

A transportation plan for Owyhee County is expected in the near future, which may alleviate OHV resource concerns because routes would be designated, reducing cross country and unauthorized travel. However, products resulting from travel management such as maps and signage are likely to result in increased visitor use, which may increase pressure on the water/ riparian resources.

Current Condition

The streams within the allotment form the headwaters of the larger drainages that define the CIAA, including Deep Creek and the Owyhee River. The water-riparian resource CIAA is 266,020 acres and contains about 144 miles of perennial streams, 768 miles of intermittent streams, and 267 springs (NHD). There are 189 miles of streams meeting the IDEQ assigned beneficial uses and water quality standards, 202 miles that have not been assessed, and 322 miles that are water quality-impaired. Beneficial uses are assigned by the IDEQ on a sub-basin scale and within the CIAA; they include cold water aquatic life, salmonid spawning, and primary and secondary contact recreation (RIPN-14). Additionally, of the water quality impaired streams, 140 miles have been through the reconnaissance process and been placed on the 303(d) list by the State (Map RNGE-1; IDEQ 2011).

All streams and springs within the allotment have been influenced by various land use activities, including livestock grazing (as noted above). The majority of the streams in the area are not meeting IDEQ water quality standards, primarily due to high water temperatures and sedimentation. Table RIPN-14 provides an overview and the pollutants of concern for the Upper Owyhee River sub-basin.

Table RIPN-14: Upper Owyhee Watershed Overview

Hydrologic Unit Code	17050104
Size	1,384,288 acres (total) 1,012,411 acres (in Idaho)
§303(d) Listed Stream Segments	Deep, Pole, Castle, Battle, Shoo Fly, Red Canyon, and Nickel Creeks; Blue Creek and Juniper Basin Reservoirs
Beneficial Uses Affected	Cold water aquatic life, salmonid spawning, primary and secondary contact recreation

Pollutants of Concern	Sediment, bacteria, flow alteration, temperature
Major Land Uses	Rangeland, riparian, forestry, irrigated agriculture

Source: (Idaho DEQ)

3.4.4.4.1 Alternatives 1 & 2 Cumulative Effects

Alternatives 1 and 2 would directly and indirectly effect the Castlehead-Lambert allotment in similar ways (see details in Sections 3.4.4.3.1 and 3.4.4.3.2). Both alternatives would continue to degrade the riparian areas because the removal of riparian vegetation, deposition of fecal matter, and livestock trampling would continue. Furthermore, the associated secondary impacts, including sedimentation, increased water temperatures, lowered water table, and decreased suitability of aquatic species habitat, would also remain the same.

All of the streams within the analysis area have been affected by past and present livestock grazing because the allotments within the CIAA have been, and continue to be, grazed during the vulnerable riparian area growing season. Under Alternatives 1 and 2, the streams in the Castlehead-Lambert allotment will continue to be grazed during the riparian area growing season, and these continued impacts, when combined with those occurring on the other allotments within the analysis area, would continue to alter stream banks because deep-rooted riparian vegetation would be removed and channels would be trampled. Consequently, stream channel morphology would change and erosion would increase, all contributing to the degradation of riparian areas and a decrease in water quality in the allotment and in the watersheds. However, present and future proposed changes in grazing management within the CIAA to make progress toward meeting Rangeland Health Standards, when added to the impacts from this action, could improve wetlands and riparian areas by increasing woody and herbaceous plant communities. As plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. The continued degradation from the action expected within the allotment would be added to the expected improvements occurring in the adjacent allotments. However, overall, the small improvements expected in the adjacent allotments would not be enough to offset the continued poor condition of the riparian and watershed conditions within the allotment under either of these alternatives, and the conditions within the CIAA would continue to be degraded.

One of the general impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment and stream temperatures and thus less suitable aquatic species habitat. The sediment increase from roads occurs where the roads cross the streams (approximately 157 places in the CIAA), after which the effect is apparent downstream of the crossings. Thus, the increase in sediment within the CIAA caused by roads currently impacts approximately 50 percent of the streams. The sediment increase caused by fires occurs because erosion increases when overland flows increase due to the loss of vegetation. Past fires have overlapped with riparian areas and have impacted about 200 miles of streams (22 percent of the mileage within the CIAA). Since the grazing management proposed under Alternatives 1 and 2 would contribute to an increase in sediment and stream temperatures, it would add to the sediment increase caused by stream crossings and loss of vegetation due to fires, and would increase the overall impact within the CIAA. The cumulative impact would be small, but when added to the impact from the other activities, the condition of the riparian areas and watersheds would continue to be degraded.

Overall, under Alternatives 1 and 2, the impacts from the proposed action would degrade about 19 miles of perennial stream, 120 miles of intermittent stream, and 37 springs within the allotment. When these impacts are added to those of the other area activities, they would add incrementally to and degrade approximately 144 miles of perennial and 758 miles of intermittent streams, along with the associated riparian areas and the water quality with the CIAA. The condition within the larger CIAA would be impacted by the additive sediment contributions and associated increase in stream temperatures and decrease in suitable aquatic species habitat. Consequently, the resources would continue to be degraded and would not make progress toward meeting Standards under either of the two alternatives.

3.4.4.4.2 Alternative 3 Effects

The direct and indirect effects from Alternative 3 (described in Section 3.4.4.3.3) would allow sufficient herbaceous and woody vegetation to remain after the growing season to protect the stream banks during high-flow events, allow vegetation to regenerate, and protect riparian soils from physical alterations. When the direct and indirect effects of Alternative 3 are added to the other past, present, and reasonably foreseeable future actions described above, the condition of the streams, springs, and associated riparian-wetland areas within the analysis area watersheds would see an overall small improvement. The improvements in the condition of the streams and springs would lead to increased riparian area function (i.e., increased water infiltration and improved aquatic and fish habitat).

Past and current livestock grazing within the CIAA generally occurs during the spring and summer months, degrading the riparian areas because streams are trampled and herbaceous and woody riparian vegetation are removed during the vulnerable riparian area growing season. Although there would be an incremental improvement from the implementation of this alternative, it would be small overall when related to the livestock grazing within the CIAA because the past and current practices in the adjacent allotments are degrading the riparian habitat. However, present and future proposed changes in grazing management should make progress toward meeting Rangeland Health Standards; when the improvements are added to those of this action, there would be an improvement in the condition of the wetlands and riparian areas because an increase in the riparian woody and herbaceous communities would occur. As the plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the small improvement expected within the allotment as well as within the adjacent allotments would lead to a small overall improvement in the condition of the riparian areas and watersheds within the CIAA.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sedimentation occurs. Additionally, the vegetation is disturbed, which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less-suitable aquatic species habitat. Fire directly removes vegetation, increasing the potential for overland flows and erosion, both leading to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a decrease in sediment and stream temperatures, it would incrementally lessen the sediment increase caused by stream crossings and loss of vegetation due to fires and would cumulatively reduce the overall impact within the CIAA.

Overall, the implementation of Alternative 3 would improve the condition of about 20 miles of perennial stream, 120 miles of intermittent stream, and 37 springs that occur within the allotment. The improvement would help offset the impacts from the other activities occurring within the CIAA, and the condition of the 144 miles of perennial, 768 miles of intermittent and 267 springs that occur within the analysis area would have a small improvement.

3.4.4.4.3 Alternative 4 Effects

As described above in the direct and indirect effects Section 3.4.4.3.4, Alternative 4 would prohibit summer/growing season grazing in the riparian pastures, which would almost completely eliminate the impacts on the riparian and water resource. Specifically, about 40 miles of intermittent streams and 14.75 acres of riparian-wetland areas associated with springs within pasture 2 would incur only those impacts associated with spring grazing. Within pastures 1 and 6, approximately 17.6 miles of perennial, 20 miles of intermittent, and 36.7 acres of spring riparian area would incur those impacts associated with spring and fall grazing during alternate years.

Since livestock grazing is the dominant land use activity in the CIAA, the impacts of Alternative 4, when added to the present and future proposed changes in grazing management (to make progress toward meeting Rangeland Health Standards) occurring in surrounding allotments, would improve the condition of the streams, springs, and associated riparian-wetland areas within the CIAA. The improvements in the condition of the streams and springs would lead to increased function (i.e., increased water infiltration and improved aquatic and fish habitat). An increase in woody and herbaceous communities would occur, and as plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the improvement expected within the allotment would help improve the condition of the riparian areas and watersheds within the CIAA.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sediment occurs. Additionally, the vegetation is disturbed which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less suitable aquatic species habitat. The impacts from roads are apparent downstream of the road crossing. Approximately 30 percent of the streams within the CIAA would be subjected to this impact. Fire directly removes vegetation, increasing the potential for overland flows and erosion, both leading to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a decrease in sediment and stream temperatures, it would incrementally reduce the sediment increase caused by stream crossings and loss of vegetation due to fires, and would incrementally reduce the overall impact within the CIAA.

The impacts on the water-riparian resources from the action under Alternative 4 that would occur within the allotment would be added to the impacts from the other areas activities and would cumulatively help improve the conditions within the larger analysis area. Specifically, the condition of approximately 144 miles of perennial streams, 768 miles of intermittent streams, and 267 springs that occur within the CIAA could improve.

3.4.4.4.4 Alternative 5 Effects

As noted above in the direct and indirect effects section, Alternative 5 would let the riparian ecosystem restore because the rest from livestock grazing would allow for the recovery of the stream bank and a functional riparian plant community. The cumulative impacts of Alternative 5 that combine extended rest from livestock grazing and proposed changes in grazing management in adjacent allotments (to make progress toward meeting Rangeland Health Standards) would result in greater and faster water-riparian resource improvement than the other proposed alternatives. The impacts would be similar to Alternative 4 because the removal of livestock grazing would move the allotment toward meeting Standards. However, since there would be no livestock grazing, improvements in the resources would occur more quickly (as previously identified in the effects analyses) and similarly, the incremental effects within the CIAA from the various resource improvements would occur at a faster rate.

3.4.5 Wildlife/Wildlife Habitat and Special Status Animal Species

3.4.5.1 Affected Environment

In addition to the general overview of the Affected Environment for Wildlife Resources in the Owyhee River allotments presented above (Section 3.3.1.5), descriptions of the current condition of species and their habitats within the Castlehead-Lambert allotment are based on the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012a) and Determination (Appendix I), affected environments of the Rangeland Vegetation and Water and Riparian Resources within this EA (Sections 3.4.1.1 and 3.4.4.1, respectively), recent personal observations, current element occurrences in IFWIS (IDFG, 2011b), and consultation with local wildlife professionals.

Wildlife Habitat

The Castlehead-Lambert allotment encompasses all three Level IV Ecoregions discussed previously (Map WDLF-1; Section 3.3.1.5). Specifically, the majority of the area of the highest elevation pastures (i.e., 1 and 6) are located within the Semiarid Uplands; a sizeable portion of pasture 2 (approximately 30 percent) is also located within this ecoregion. The Owyhee Uplands and Canyons ecoregion covers the majority of pastures 2 and 5 and smaller portions of pastures 1, 3, and 6 on the mid-elevation portions of Juniper Mountain. The majority of springs and perennial streams within the allotment occur within these aforementioned ecoregions at mid- to higher elevations. Lastly, the majority of pasture 3 and all of pasture 4 are located in the Dissected High Lava Plateau ecoregion.

Within the allotment, these ecoregions are characterized by rolling shrub steppe uplands interrupted by juniper woodlands, low hills, rocky outcrops, rugged badlands, and precipitous river canyons. Currently, the expansion of juniper into former shrub communities has transformed much of the area into woodlands ranging from open, savanna-like conditions to dense, nearly closed-canopy forest (Section 3.4.1.1). These denser woodlands cover the relatively low profile flanks of the upper elevations of the mountain (Map WDLF-2). Riparian areas occur throughout the upper and mid-elevation pastures along many perennial streams (Section 3.4.4.1). Wildlife habitats within the Castlehead-Lambert allotment include juniper woodlands, mountain shrublands, sagebrush steppe, grasslands, wet meadow complexes, riparian areas, springs and seeps, and many small reservoirs (Table WDLF-1; Map WDLF-2). A detailed discussion of upland and riparian vegetation within the allotment can be found in Sections 3.4.1 and 3.4.4.

Table WDLF-1: Major habitat and general cover types[1] within the Castlehead-Lambert allotment

Habitat Type	General Cover Type	Percentage of Allotment	
		General Cover Type	Habitat Type
Grassland	bunchgrass	43	43
Shrub Steppe[2]	big sagebrush	3	39
	mountain big sagebrush	7	
	low sagebrush	29	
Mountain Shrub	bitterbrush	< 1	3
	mountain shrub	3	
Forest	aspen	< 1	11
	juniper	11	
Riparian	wet meadow	< 1	< 1
Non-native/Disturbed	exotic annuals	< 1	2
	rabbitbrush	2	

[1] The spatial data set for general vegetation cover types was prepared by the Pacific Northwest National Laboratory in 2003 and modified by the most current National Agriculture Imagery Program aerial photography (2011) and BLM unpublished wildfire data (2011). These data may be found online or are available from the BLM by request.
[2] The shrub steppe habitat type includes the predominant big and low sagebrush communities in the area. Big sagebrush (*Artemisia tridentata*) cover types include communities dominated by the Wyoming (*Artemisia t. wyomingensis*) and Basin (*Artemisia t. tridentata*) subspecies, as well as mixed communities dominated by either subspecies. Mountain big sagebrush (*Artemisia t. vaseyana*) and low sagebrush (*Artemisia arbuscula*) cover types comprise the remaining shrub steppe communities.

Uplands

As discussed in Section 3.4.1.1, most upland vegetation communities within the allotment do not have the full complement of dominant shrubs and grasses that would be expected to occur based on ecological site potential and have departed from reference plant community phase conditions (compare Map WDLF-2 to Map ECOL-1). With the exception of pasture 4, recent wildfires have had profound effects on vegetation communities and habitat types throughout the allotment. Within large areas of pastures 1, 2, 3, 5, and 6, the juniper clearing effects of the 2007 Crutcher wildfire have resulted in vast areas of perennial native grasslands (Map WDLF-2). Demonstrable post-burn recovery of native plant communities in these affected upland habitats is ongoing (USDI BLM, 2010), and primarily characterized by the native deep-rooted bunchgrass phase (i.e., Phase D) generally common to the reference states (i.e., State 1) of the predominant affected ecological sites (i.e., R025XY010ID and R025XY011ID) (USDA NRCS, 2010). Although invasive species (e.g., cheatgrass) are present as a minor component, these grasslands are generally providing abundant suitable habitat for generalist and dependent wildlife species.

Upland wildlife habitats within the unburned portions of the allotment (with the exception of pasture 4), however, have departed substantially from reference state conditions and what would be expected under a natural disturbance regime (i.e., periodic wildfires) (Rowland, Suring, Tausch, Greer, & Wisdom, 2008). Sagebrush steppe and mountain shrub communities that would be expected in these unburned areas in pastures 1, 2, 3, 5, and 6, based on ecological site descriptions, are being negatively impacted by juniper encroachment and have been predominantly converted to woodland habitat (USDI BLM, 2012a). The transition from reference plant community conditions to a new state (i.e., State 3) due to juniper encroachment and shifts in vegetation functional-structural groups has resulted in the dominance of juniper woodland habitat and an overrepresentation of shallow-rooted, short-statured bluegrasses (i.e., Sandberg and bulbous) and an underrepresentation of sagebrush species and dominant deep-rooted, tall perennial bunchgrass species (i.e., bluebunch wheatgrass, Idaho fescue, Thurber’s needlegrass). Healthy, productive, and diverse populations of native perennial grasses, forbs, and shrubs are not maintained with increasing juniper encroachment (Huxman, et al., 2005) (Rowland, Suring, Tausch, Greer, & Wisdom, 2008), and what remains in the juniper-dominated areas of the allotment does not provide for proper nutrient cycling, hydrologic cycling, and energy flow (USDI BLM, 2012a).

Although the increase in juniper cover may have benefited some woodland-associated special status wildlife species such as northern goshawks and Lewis' woodpeckers, these woodland habitats are unsuitable for and have come at the expense of sagebrush-obligate and shrub-dependent special status species such as greater sage-grouse, pygmy rabbits, Brewer's sparrows, loggerhead shrikes, sage sparrows, and Wyoming ground squirrels. However, as mentioned previously, the Crutcher wildfire substantially reduced juniper dominance in pastures 1, 2, 3, 5, and 6, (ranging from approximately 20 to 90 percent per pasture). The return of native perennial bunchgrasses and forbs in the short term and the shrub component in the long term (i.e., 20 to 50 years) (USDI BLM, 2010) should provide the structural and functional constituents necessary for suitable breeding habitat for shrub-associated species and foraging habitat for spotted and Townsend's big-eared bats, as well as raptors such as golden eagles, ferruginous hawks, and prairie falcons.

Upland habitats that have not been affected by juniper encroachment or recent wildfires are primarily located within pasture 4 (Map WDLF-2). In general, these existing shrub steppe habitats are represented by herbaceous understories with less deep-rooted, tall bunchgrasses (i.e., bluebunch wheatgrass, Idaho fescue) and far more shallow-rooted, short-statured grasses (i.e., Sandberg bluegrass) than would be expected to occur based on ecological site potential (Section 3.4.1.1). These conditions indicate that the predominant ecological site and attendant shrub steppe community (R025XY014ID and low sagebrush/Idaho fescue-bluebunch wheatgrass, respectively), although still in the reference state (i.e., State 1), appear to be transitioning to a new phase (i.e., Phase C: low sagebrush/Sandberg bluegrass with remnants of Idaho fescue-bluebunch wheatgrass) and run the risk of crossing the threshold to a new state (i.e., State 3: low sagebrush/Sandberg bluegrass-cheatgrass-medusahead) indicative of improper grazing management (USDA NRCS, 2010). Although the current vegetation communities retain a composition of native perennial species that currently are providing proper nutrient cycling, hydrologic cycling, and energy flow, biotic integrity appears to be slightly compromised (USDI BLM, 2012a). These habitat conditions are only minimally providing the protective cover and nesting and foraging habitat that many shrub-obligate wildlife species require.

Riparian

Riparian and wetland habitats accessible to livestock grazing are not meeting the habitat requirements for dependent wildlife species due to a lack of hydric vegetation, limited quantity and structural diversity of woody species, and soil instability along streambanks and in wet meadows (Section 3.4.4.1). Typically, for the reaches of stream that are not in proper functioning condition, there is inadequate riparian-wetland vegetation present to protect streambanks and dissipate energy during high flows, and plant communities are often not comprised of the expected deep-rooted bank stabilizing hydric species. Heavy woody and herbaceous riparian vegetation use and streambank trampling by livestock have reduced nesting substrate, protective cover, and foraging areas for many riparian-dependent migratory birds and special status wildlife species such as northern goshawks, calliope hummingbirds, willow flycatchers, and some special status bat species like fringed myotis. Heavy use and trampling in riparian areas also have increased stream temperatures, channel width-to-depth ratios, and sediment loads which degrade and limit suitable habitat for aquatic special status species such as Columbia spotted frogs, western toads, common garter snakes, and redband trout. In addition to the effects of livestock grazing, juniper encroachment is threatening riparian areas and aspen stands and limiting the amount of nesting and foraging habitat many riparian-dependent migratory birds and special status species require. Based on these existing poor riparian habitat conditions, the allotment currently is not meeting Standard 8 (Threatened and Endangered Plants and Animals) for many special status animal species due to the effects of current hot-season livestock grazing practices in riparian-wetland habitats.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Historically, a majority of the allotment provided suitable habitat for sage-grouse and supported significant populations (USDI BLM, 1969). Currently, sage-grouse PPH and PGH occurs throughout the Castlehead Lambert allotment (Map WDLF-5). The most recent revision to the PPH model incorporates additional information including a sagebrush component and a restoration potential component (version 2) (Makela & Major, 2012). Within the allotment, PPH includes all three subcategories (i.e., sagebrush, perennial grasslands, and conifer encroachment areas; Table WDLF-2; Map WDLF-5). However, there are substantial areas of PGH and non-habitat at higher elevations in pastures 1, 2, and 6, and in the steep canyons and rocky badlands of pastures 3 and 6. Much of the PPH within allotment is identified as sagebrush-limited (i.e., perennial grassland; Map WDLF-5) due to several fires that occurred in 2000 and 2007 (Map FIRE-1). In addition, large areas of juniper encroachment occur throughout the allotment and include patches within the burn perimeters that remained after the fires (Map WDLF-2 and WDLF-5). In general, the amount and extent of sagebrush vegetation communities in the allotment are restricted.

Currently utilizable sage-grouse habitats are very limited or absent within pastures 1, 3, 5, and 6 (Map WDLF-5). The majority of potential sage-grouse habitat within these pastures has been converted to juniper woodlands or is composed of perennial grasslands due to recent wildfires (USDI BLM, 2012a). The Conservation Plan for Greater Sage-grouse in Idaho (Idaho Sage-grouse Advisory Committee, 2006) identifies juniper encroachment and wildfires as serious threats to sage-grouse habitat. Sage-grouse use in areas with junipers is probably limited due to the increased predation risk trees impart (trees provide perches and cover for avian and terrestrial predators). Restoration of sage-grouse breeding habitat within portions of these pastures may require a considerable amount of time, as recovery of the mountain sagebrush community and decay of the juniper snags is estimated to take from 35 to 200 years (Baker, 2006) (Huffman, Crouse, Chancellor, & Fulé, 2012). Although wildfire has also been cited as a substantial threat to sage-grouse habitat (Idaho Sage-grouse Advisory Committee, 2006) primarily due to loss of sagebrush nesting cover for a considerable period of time (Nelle, Reese, & Connelly, 2000) (Hess & Beck, 2012) and an increased risk of invasion by cheatgrass in low elevation Wyoming big sagebrush communities (Chambers, Roundy, Blank, Meyer, & Whittaker, 2007), research in mountain big sagebrush communities has documented return to pre-burn conditions by 15 years post-burn in some locations (Bunting, Kilgore, & Bushey, 1987) and non-random selection by brooding sage-grouse in areas < 10 years post-burn (Thacker, 2010). Nevertheless, these results should be viewed with some caution as site-specific results could vary and additional research has been advised to assess the effects of burning and demographic responses of sage-grouse across all sagebrush habitats (Beck, Connelly, & Wambolt, 2012).

Table WDLF-2: Sage-grouse habitat acreage within Castlehead-Lambert allotment, 2012

Pasture	Preliminary Priority Habitat (PPH)				PGH	Non-habitat
	Sagebrush	Perennial Grassland	Conifer Encroachment	Total		
1	0	0	203	203	613	3849
2	487	2844	4549	7880	317	996
3	7	7906	1809	9721	1607	0
4	11241	77	412	11730	27	0
5	0	1579	199	1778	28	44
6	0	509	535	1044	982	5226
Total (% of allotment)	11734 (25 %)	12914 (28 %)	7706 (17 %)	32355 (70 %)	3575 (8 %)	10115 (22 %)

Areas of usable PPH-sagebrush are present within the allotment and occur at lower elevations in pasture 2 and cover the vast majority of pasture 4 on Lambert Table (Map WDLF-5). Preliminary priority habitat-sagebrush within pastures 2 and 4 is adjacent to areas of juniper encroachment, as well as on the periphery of large contiguous areas of PPH-sagebrush to the east (Map WDLF-5). Within pasture 2, PPH-sagebrush is limited to the eastern portion of the pasture. These lower elevation areas of the pasture provide breeding habitat in the scattered inclusions of big sagebrush within the surrounding low sagebrush communities. Breeding habitat conditions within these areas are currently rated as suitable ((USDI BLM, 2012a)p. 67-68). The various springs, seeps, and low gradient, shallow drainages of Carter and Beaver Creeks and their tributaries that retain more mesic conditions than surrounding uplands provide scattered brood-rearing habitat. Brood-rearing habitat conditions within pasture 2 are currently rated as unsuitable ((USDI BLM, 2012a) p. 68). In addition to the overall degraded riparian and wetland condition within the pasture due to current hot-season livestock grazing practices (Section 3.4.4.1; (USDI BLM, 2012a) p. 66), unsuitable brood-rearing habitat conditions are specifically due to juniper encroachment, scarcity of forbs, and the degraded condition of riparian site stability ((USDI BLM, 2012a) p. 68). Distance to sagebrush and invading xeric species into the floodplain were also contributing factors to the current unsuitability of brood-rearing habitat.

Most of pasture 4 is also classified as PPH-sagebrush (Map WDLF-5). Pasture 4 is located entirely on Lambert Table, a distinct, flat-topped, basalt-capped geomorphic feature which, along with Juniper Mountain, dominates the Castlehead-Lambert landscape (Map WDLF-5). Similar to pasture 2, pasture 4 provides breeding habitat in the scattered inclusions of big sagebrush within the surrounding low sagebrush communities. Recent sage-grouse breeding habitat assessments conducted within pasture 4 indicate that although sagebrush height and growth form are appropriate for the site, overall conditions are marginal due primarily to inadequate grass and forb height and a general lack of preferred forb abundance and diversity ((USDI BLM, 2012a) p. 73-75). A greater abundance of short-statured bluegrasses and cheatgrass than expected also contributes to the marginal breeding habitat conditions (USDI BLM, 2012 p. 72). Brood-rearing habitat is limited to the shallow swales that direct ephemeral water courses into various reservoirs and off Lambert Table during spring run-off (Map WDLF-5). These swales retain mesic conditions for brood-rearing habitat longer than surrounding areas in pasture 4; however, brood-rearing habitat is supplemented in the landscape immediately surrounding Lambert Table by springs and seeps emanating from below the rim (e.g., Twin and Ryegrass Springs) as well as the perennial and intermittent streams in the Red Basin and Brace Flat area (Red Basin, Carter, and Porcupine Creeks; Map WDLF-5). Lambert Table also provides abundant winter habitat; past and current canopy cover and height measurements of sagebrush indicate suitable conditions ((USDI BLM, 2012a) p. 73-74).

In general, breeding habitat within pastures 2 and 4 could be enhanced through improvements to vegetation community composition (i.e., shift to more taller-statured, deep-rooted bunchgrasses) which likely would result in taller herbaceous vegetation heights (i.e., better sage-grouse nesting and concealment cover) and possibly outcompete and replace invasive annual species such as cheatgrass (Blank & Morgan, 2012). However, many riparian and wetland areas within pastures 1, 2, 3, 5, and 6 that sage-grouse could potentially use during late brood-rearing and summer are currently unavailable or in unsuitable condition due to the effects of recent wildfires, juniper encroachment and dominance, and current hot-season livestock grazing practices (Section 3.4.1.1 and 3.4.4.1). Overall, sage-grouse habitat in the allotment is in need of enhancement and restoration through improved livestock management in riparian areas, restoration of sagebrush in perennial grassland areas, and juniper reduction.

At least two occupied leks are known to occur within the allotment. Both of these leks are located in pasture 4 on Lambert Table and both were active in 2012 (Table WDLF-3; Map WDLF-3). In addition, the allotment is located within the 75 percent breeding bird density (BBD) buffer (4 miles) of two additional occupied leks (Table WDLF-3; Map WDLF-3). The 75 percent BBD buffer is highly correlated to breeding habitat surrounding the lek and corresponds to the high abundance (or population) component of the PPH area (Makela & Major, 2012). Because counts at these leks have only recently been conducted with any regularity via helicopter 1 day annually, generating long-term trends in lek attendance includes an unknown and possibly high degree of uncertainty and should be avoided.

Table WDLF-3: Attendance at occupied leks[1] in or within 4 miles of the Castlehead-Lambert allotment, 2007-2012

Lek	Location	Survey Year[2]					
		2012	2011	2010	2009	2008	2007
2O617	Pasture 4	43	58	6	14	--	24
2O228	Pasture 4	41	35	51	--	--	16
2O466	<1.5 miles SE	5	8	12	6	--	43
2O310	<3.6 miles NE	70	76	80	--	--	23

[1]A traditional display area where two or more male sage-grouse have attended in 2 or more of the previous 5 years (Idaho Sage-grouse Advisory Committee, 2006)
[2]Surveys were not conducted in years indicated by dashes (--).

As discussed above, potential nesting habitat currently occurs within pastures 2 and 4. Nesting efforts within pasture 2 would likely result from sage-grouse attending lek 2O310. However, nesting sage-grouse attending lek 2O230 more than likely are nesting in the abundant surrounding PPH-sagebrush in the adjacent Nickel Creek allotment. Lek 2O310 is the largest lek (i.e., maximum number of sage-grouse attending the lek) within the Owyhee subpopulation, based on lek counts conducted from 2006 to 2010 (Makela & Major, 2012). Nesting efforts within pasture 4 would likely result from sage-grouse attending the two leks located on Lambert Table (Map WDLF-3). Leks 2O617 and 2O228 are two of the largest 10 leks within the Owyhee subpopulation. Although nesting efforts within pasture 4 could result from sage-grouse attending nearby leks outside the allotment (e.g., 2O466), most nesting sage-grouse probably are attending leks on Lambert Table. Because lek 2O466 is located south of the East Fork Owyhee River (Map WDLF-3), their use of the Castlehead-Lambert allotment may be restricted by the predation risk incurred by flying over the canyon.

Columbia spotted frog

Various agencies and researchers have surveyed potential spotted frog habitat throughout the Owyhee Mountains and Uplands since 1994 (Munger, et al., 1994) (Munger, Ames, & Barnett, 1997) (Owyhee Columbia Spotted Frog Working Group, 2007) (La Fayette, 2010) (Lohr & Haak, 2009) (Lohr, 2011). Although occurrence information available from IFWIS (IDFG, 2011b) has not documented spotted frogs within the allotment, they have been observed in five of the eight sub-watersheds that intersect with the allotment (i.e., Beaver Creek, Castle Creek, Deep Creek Spring-Deep Creek, Nickel Creek, and Red Canyon 6th level hydrologic units; Map WDLF-4). Spotted frogs have been documented in Smith Creek approximately 1.3 miles downstream from pasture 1, in Brace Reservoir approximately 0.5 miles east of pasture 2, and less than 0.2 miles upstream of pasture 6 in the West Fork of Red Canyon. Because spotted frogs have been documented in close proximity to the allotment, there is a very high probability that they could occur within the allotment. The majority of wetland and riparian areas in the allotment are in poor condition (Section 3.4.4.1) and are providing either marginal or unsuitable habitat for the maintenance of viable spotted frog populations. However, areas of suitable habitat conditions occur within some exclosures where livestock grazing is excluded or along reaches of streams inaccessible to cattle. Beaver ponds create good habitat for spotted frogs; however, loss of willows and aspen in riparian areas due to livestock grazing and juniper encroachment has reduced available food and resources for beaver, and they are not known to occur within the allotment currently.

Pygmy rabbit

A coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests that portions of all pastures within the allotment have a moderate likelihood of core habitat presence. However, habitat in the majority of the allotment is unsuitable for pygmy rabbits; only 10 percent of the allotment is classified as having the appropriate cover type the species prefers (i.e., big sagebrush and friable soils; Table WDLF-1). Suitable sagebrush habitat and soils are mostly absent or now dominated by junipers in pastures 1 and 2. Pastures 3 and 4 are characterized by very shallow, clayey soils and rock outcrops, but suitable loose, friable soils are limited. In addition, big sagebrush habitat is mostly absent in pasture 3 due to conversion to perennial grasslands resulting from the 2007 Crutcher fire and juniper woodlands. Similarly, in pastures 5 and 6, areas that would support suitable big sagebrush habitat do not support this habitat due to the 2007 Crutcher fire. To date, pygmy rabbit surveys have only been conducted in pasture 1. No pygmy rabbit surveys have been conducted within the remaining pastures. Pygmy rabbits have not been documented within the allotment, and the 2005 surveys did not reveal evidence of their presence (e.g., individuals, burrows, pellets) (USDI BLM, 2012a).

<u>Columbia River redband trout</u>
Within the allotment, redband trout have been documented in Little Smith Creek in pasture 1 and the East and West Forks of Red Canyon in pasture 6 (Map WDLF-4). In addition, redband trout occupy the reaches of Red Canyon that traverse pasture 3 on a seasonal basis. These reaches often subside underground by late summer, and the fish move either upstream into the East and West Fork of Red Canyon or downstream into reaches of Red Canyon outside of the allotment. Trout may use the upper reaches of Castle Creek within pasture 1 because they are known to inhabit the creek just downstream of the allotment boundary. The majority of trout habitat in pastures 1, 3 and 6 is not in proper functioning condition (Section 3.4.4.1), and thus the streams are not providing adequate habitat conditions to maintain viable trout populations. Redband trout are not known to occupy the intermittent and ephemeral streams within the remaining pastures. Overall, habitat for redband trout is degraded due to grazing effects in riparian areas and juniper encroachment (Section 3.4.4.1). In addition, fish and fish habitat downstream of the allotment are affected by activities taking place upstream.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

In addition to the general discussion of migratory birds, raptors, and other bird species and their habitats in Section 3.3.1.5, a variety of bird species have the potential to occur or have been documented within and in the vicinity of the Castlehead-Lambert allotment (Appendix L). The juniper woodlands and riparian areas within them are either known to or potentially could provide nesting and foraging habitat for many special status and migratory birds. As discussed above, the expansive juniper woodland habitat that currently occupies ecological sites that otherwise would be dominated by the expected sagebrush habitats in the absence of juniper encroachment presently has augmented the population of woodland birds that would be a far minor component of the area's overall bird community. Under natural disturbance regimes, juniper woodland bird species would be limited to widely scattered, solitary old-growth junipers or small stands that would be expected to occur on shallow, rocky soils as restricted inclusions within sagebrush or mountain shrub ecological sites (USDA NRCS, 2010). Junipers and aspen provide nesting and foraging substrate for foliage and bark gleaning species such as black-throated gray and yellow-rumped warblers, mountain bluebird, Townsend's solitaire, hairy woodpecker, and red-naped sapsucker. Ground gleaning species within woodland habitats include American robin, black-billed magpie, chipping sparrow, and dark-eyed junco. In addition, juniper woodlands provide habitat for owl and raptor species such as flammulated owl, long-eared owl, northern saw-whet owl, northern goshawk, and red-tailed hawk. Red-tailed hawk nests are common in the area's aspen stand and at least three northern goshawk nesting areas with multiple nest sites have been documented within 0.5 to 4 miles from the allotment. All nests were constructed within mature, large aspens.

Riparian habitat along the perennial streams in the Juniper Mountain area hosts a variety of obligate and dependent bird species. Riparian-obligate species, like yellow warbler, and dependent species such as black-capped chickadee, black-headed grosbeak, house wren, and warbling vireo have been documented in the Juniper Mountain area. These species prefer the structural diversity found in riparian areas with aspen and willow canopies and herbaceous understories along streambanks. The absence of disturbance associated with livestock grazing within these riparian communities has been demonstrated to result in high-quality breeding habitat (i.e., high nest success, low brood parasitism rates) for many of these species (Heltzel & Earnst, 2006).

The varied mountain shrub communities that integrate with open woodlands and sagebrush steppe provide breeding and foraging habitat and cover for aerial, bark, and foliage gleaners such as ash-throated and gray flycatchers, Brewer's blackbird, common poorwill, and northern flicker. Ground foraging species in these habitats include green-tailed towhee, mourning dove, Cassin's and house finches, and lark and white-crowned sparrows. Maintaining adequate amounts of the different successional states along the shrub steppe to juniper woodland gradient is important in preserving bird species diversity throughout these habitat types (Reinkensmeyer, Miller, Anthony, & Marr, 2007). Several species that also favor these habitats but negatively affect local migratory bird populations through brood parasitism or usurpation of nesting cavities include the brown-headed cowbird and the invasive European starling (*Sturnus vulgaris*), respectively.

Shrub steppe habitats dominated by several species of sagebrush and perennial grasslands provide vital nesting and foraging habitat for obligate species such Brewer's and sage sparrows and dependent species including loggerhead shrike and sage thrasher. Direct loss, fragmentation, and degradation of sagebrush habitats connected with the spread of invasive plants, altered disturbance regimes, and the associated state transitions from stable native vegetation communities are some of the most important factors affecting long-term and regional population dynamics of these species (Knick & Rotenberry, 1995) (Knick & Rotenberry, 2000) (Knick & Rotenberry, 2002) (Knick, et al., 2003) (Knick, Holmes, & Miller, 2005). Passerine species like vesper sparrow, horned lark, western meadowlark, and rock wren, and raptors such as golden eagle, prairie falcon, ferruginous and rough-legged hawks, and burrowing and short-eared owls have also been documented in the area's shrub steppe vegetation communities.

Although limited in number, ponds provide foraging habitat for killdeer, spotted sandpiper, Wilson's phalarope, and white-faced ibis. Wetlands and wet meadows provide nesting substrate and cover for red-winged blackbird, song sparrow, and Wilson's snipe. In addition, open wetlands with abundant flying insects are important foraging areas for aerial foragers such as barn, tree, and violet-green swallows. Raptor species associated with water such as bald eagles, osprey, and peregrine falcons have been documented in the area during migration and winter.

Big Game and other Mammals (including Special Status Species)

In addition to the general discussion of big game and other mammal species and their habitats in Section 3.3.1.5, various big game and special status mammal species use a variety of habitats in the Castlehead-Lambert allotment for some or all of their seasonal needs. Big game species including elk, mule deer, pronghorn, and California bighorn sheep occur within the allotment throughout the year.

California bighorn sheep occur within limited portions of pastures 3 and 4 adjacent to the canyons of the East Fork Owyhee River and Red Canyon Creek. Generally these same use areas in pastures 3 and 4 are part of the designated Owyhee River Bighorn Sheep Habitat Area ACEC (Map ACEC-1). Approximately 28 percent (3,174 acres) and 40 percent (4,739 acres) of pastures 3 and 4, respectively, are part of the 141,796-acre ACEC. The ACEC was designated to protect and enhance habitat for bighorn sheep, to maintain or improve the habitat to at least a good range condition class, and to protect and maintain the scenic and natural values present in the area (USDI BLM, 1999a). In addition, IDFG has identified the more rugged portions of pastures 2, 5, and 6 as bighorn sheep use areas (Map WDLF-4). However, based on occurrence records, it does not appear that bighorn sheep have made extensive use of these parts of the allotment historically. Based on radio-telemetry research in the late 1990s, which included Lambert Table within the study area, only 7 percent of relocations of collared bighorn sheep occurred within pasture 4;

the remainder occurred within the Owyhee River canyon (USGS, unpublished data). Relocated bighorn sheep within pasture 4 occurred within 0.3 miles of the canyon rim (i.e., pasture/allotment boundary). Nevertheless, due to the juniper clearing effects of the 2007 Crutcher fire, it is possible that bighorn sheep may currently be expanding use farther up the rugged canyons and adjacent uplands of the East and West Forks of Red Canyon within these pastures as habitat conditions have become more favorable (i.e., increased viewshed due to decreased density of woodlands).

The woodland and mountain shrub habitats within pastures 1 and 6 (as well as the higher elevations of pastures 2 and 5) provide abundant summer habitat for elk and mule deer. Although mule deer may be present year-round within the allotment, most winter habitat for both species occurs at lower elevations in Oregon or the nearby canyons of the Owyhee River and its tributaries. The area has traditionally yielded large, highly prized bulls during the very limited annual hunt (IDFG, 2010a). Pronghorn use within the allotment is mostly restricted to Lambert Table (pasture 4) and the lower elevations of pastures 2 and 3 where open grasslands and sagebrush provide suitable spring range. Year-round pronghorn habitat is abundant in the rolling shrub steppe communities east of the allotment.

Although the geographic distributions and preferred habitats of several other special status mammal species including the dark kangaroo mouse and Wyoming ground squirrel occur in the area, the allotment is located at the northern extent of their ranges and occurrence within suitable lower elevation habitats in pastures 2 and 3 is probably inhibited by the east-west trending Owyhee River canyon.

3.4.5.2 Direct and Indirect Effects

3.4.5.2.1 Alternative 1 Effects

Because the livestock grazing that has occurred under Alternative 1 has led to the current condition for upland and riparian wildlife habitats, it will serve as the baseline for comparison to the other alternatives. Current grazing management has been shown to reduce cover and forage for wildlife in riparian areas and lead to trampling and breakdown of streambanks (Section 3.4.4.3.1). In addition, frequent grazing during the active growing season in the uplands has led to static habitat conditions that have not allowed improvements to perennial bunchgrass vigor and health nor progress toward a full complement of native perennial species consistent with ecological site potential (Section 3.4.1.2.1). Continuation of extended hot-season grazing would concentrate livestock use on riparian areas, thus decreasing riparian vegetation that wildlife use for nesting substrate, cover, and foraging habitat. Streambank trampling would add sediment into streams and increase channel width-to-depth ratios, which increase water temperatures and decrease water quality to unacceptable levels for some fish and amphibian species. Although conditions are not expected to either improve or worsen in upland habitats, significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would not occur due to the continuation of extended hot-season grazing that degrades habitat in riparian areas.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Although some positive effects to sage-grouse from livestock grazing have been documented (e.g., vegetative growth stimulation and greater availability of food forbs with light grazing) (Beck & Mitchell, 2000), they appear to be neutralized or outweighed by the negative effects (e.g., trampling eggs, nest desertion, deteriorated wet meadow hydrology) (Connelly, Braun, Schroeder, & Hagen, 2007). Under Alternative 1, effects of spring livestock grazing on sage-grouse and their habitat in pastures 2 and 4 that have the potential to occur include trampling of eggs, nest desertion, and continuation of marginal to suitable nesting cover (i.e., sagebrush and perennial bunchgrass canopy cover and heights) during the breeding season. In addition, effects to sage-grouse brood-rearing habitat in pastures 2 from grazing under Alternative 1 would include continued deteriorated wet meadow hydrology and invasion of xeric species, low abundance and diversity of forbs, and little herbaceous vegetation (which provide forage and

concealment directly and more insect prey indirectly) in riparian-wetland areas (Section 3.4.4.1; (USDI BLM, 2012a) p.66 and 68). Effects in upland sage-grouse habitats would be expected for the term of the permit, while effects in riparian-wetland habitats (deteriorated wet meadow hydrology in particular) could persist for several decades.

Grazing management in sage-grouse habitat should include the long-term objective of promoting desirable plant communities and the annual objective of retaining a standing crop that adequately provides cover for sage-grouse (Cagney, et al., 2010). General grazing management recommendations for nesting and early brood-rearing habitats includes maintaining the sagebrush/bunchgrass plant community wherever present, managing for high vigor in all plant communities, avoiding repeated use of bunchgrasses during the critical growing season, and limiting utilization to moderate levels to assure that the previous year's standing crop is available as hiding cover (Cagney, et al., 2010).

Specifically, current scientific literature identifies adequate canopy cover of sagebrush and tall grasses for nesting, abundant and diverse forbs and insects for brood rearing, and access to succulent and herbaceous riparian vegetation for summer foraging as critical components of healthy sage-grouse habitats (Crawford, et al., 2004). Greater sagebrush and herbaceous cover provides vertical and horizontal concealment of nests from predators and has been demonstrated to result in higher nest success (Connelly, Wakkinen, Apa, & Reese, 1991) (Gregg, Crawford, Drut, & DeLong, 1994) (DeLong, Crawford, & Delong, Jr., 1995) (Moynahan, Lindberg, Rotella, & Thomas, 2007) (Coates & Delehanty, 2010). In general, these studies observed that perennial herbaceous cover at successful nests averaged more than 7 inches in height. Based on these and other studies, current guidelines recommend managing breeding habitats to support perennial herbaceous vegetation averaging more than 7 inches in height at the end of the nesting period (Connelly, Schroeder, Sands, & Braun, 2000), and residual grass heights more than 4 inches at the beginning of the nesting season (Hausleitner, Reese, & Apa, 2005) (Holloran, et al., 2005).

Under Alternative 1, perennial herbaceous vegetation heights are expected to average more than 9 inches at the beginning and end of the nesting season in pastures 2, based on data collected within the allotment in 2009 ((USDI BLM, 2012a) p. 68). In pasture 4, perennial herbaceous vegetation heights are expected to average more than 5 inches at the beginning and end of the nesting season, based on data collected within the allotment in 2009 ((USDI BLM, 2012a) p. 74). Average perennial herbaceous vegetation heights of fewer than 7 inches that would result in pasture 4 from grazing under Alternative 1 would continue to only provide marginal nesting cover in 2 out of the 3 years that pasture 4 would be grazed. Average perennial herbaceous vegetation heights would likely be taller during years when the pastures were rested which would periodically provide taller average perennial herbaceous vegetation heights and better nesting habitat conditions.

Current scientific literature also suggests that a healthy and vigorous herbaceous understory of native perennial bunchgrasses is closely associated with sage-grouse productivity (Crawford, et al., 2004) (Hagen, Connelly, & Schroeder, 2007). Thus, some researchers recommend that certain grazing utilization limits be placed on pastures with sage-grouse habitat to ensure long-term productivity of bunchgrasses (Braun, 2006). It is unlikely that sage-grouse select habitat based on utilization levels, much less even perceive it. Because percent utilization of vegetation is dependent on a variety of factors (e.g., species, annual growing conditions, differences in observers and methods), the concept is independent of and uncorrelated to the actual structural and physical properties of the plants on which sage-grouse most likely are selecting for. Nevertheless, utilization can be a useful tool in managing for the health of native perennial bunchgrasses in the short and long term.

A review of the literature suggests that 40 to 45 percent utilization (i.e., moderate *sensu* (Holechek, Baker, Boren, & Galt, 2006)) will maintain the health and vigor of bunchgrasses and other rangeland vegetation, and 30 to 35 percent utilization (i.e., conservative *sensu* (Holechek, Baker, Boren, & Galt, 2006)) is needed to improve the health and vigor of bunchgrasses and other rangeland vegetation (Holechek, Gomez, Molinar, & Galt, 1999). Under Alternative 1, levels of utilization in pastures 2 and 4 are expected to be consistent with documented levels that have generally averaged in utilization levels over 35 percent ((USDI BLM, 2012a) p. 145). Under these stocking rates and resultant conservative to moderate utilization levels, perennial bunchgrass and rangeland vegetation will remain mostly static over the term of the permit, and the conditions of upland sage-grouse nesting habitats will remain similar to current conditions which, although providing suitable habitat in pasture 2, are only supplying marginal habitat in pasture 4.

In the past 3 to 5 years, one advocacy group has demanded that BLM abide by the recommendations of one particular sage-grouse expert, Dr. Clait Braun, although this same author has previously acknowledged that there is scant evidence correlating sage-grouse population levels with grazing practices (Connelly & Braun, 1997). In an unpublished and non-peer reviewed document, Dr. Braun advocates for a maximum of 30 percent utilization in sage-grouse habitats (Braun, 2006). In addition, Dr. Braun recommends that grazing should not be permitted in sage-grouse habitat during the breeding season (mid-April to early to mid-June) (Braun, 2006). Although Dr. Braun's utilization recommendations are designed to achieve adequate breeding and concealment cover and to ensure the long-term health of native bunchgrass communities, BLM has decided that perennial herbaceous vegetation height is a more accurate, consistent, and repeatable measure of determining adequate cover than subjective percent utilization levels. Nevertheless, under Alternative 1, BLM would implement a utilization limit of 50 percent, which would neither maintain nor improve the health and vigor of bunchgrasses and other rangeland vegetation.

With respect to excluding grazing in sage-grouse habitat during the breeding season, there is little evidence in the scientific literature to support Dr. Braun's proposal that grazing should be prohibited until after June 20th. Although the trampling of eggs and nests by livestock and subsequent displacement and nest abandonment have been documented (Coates, Connelly, & Delehanty, 2008), these direct effects are rare and isolated, and more than likely have a negligible influence on population levels. Alternatively, the grazing effects associated with the long-term health of native plant communities and the relationship between herbivory and the removal of cover has been shown to be the important and relevant issues affecting sage-grouse and their habitats. Improving juvenile survival rates by increasing the quantity and quality of early brood-rearing habitat as suggested by Connelly and Braun (1997) appear to have more influence on sage-grouse populations than other factors related to overall reproductive success (i.e., nest success and breeding success) (Aldridge & Brigham, 2001) (Aldridge & Brigham, 2002). Accordingly, while prohibiting grazing during the breeding season may reduce some impacts to sage-grouse and their habitats, it is not required to ensure juvenile survival and increases in sage-grouse populations.

As discussed above, grazing under Alternative 1 would not result in improvements to sage-grouse brood-rearing habitat in pastures 2. Riparian-wetlands would continue to remain in a degraded state due to continued deteriorated wet meadow hydrology and invasion of xeric species, low abundance and diversity of forbs, and scant herbaceous vegetation (Section 3.4.4.3.1).

Because implementation of Alternative 1 does not institute any practical measures for the conservation of sage-grouse (such as requiring suitable perennial herbaceous cover, which has been shown to increase nesting success and juvenile survival) or other special status species, this alternative is not consistent with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Columbia spotted frog

Habitat for spotted frogs would continue to deteriorate from loss of cover, degraded aquatic habitat, and reductions of prey items. Under Alternative 1, riparian and wetland areas would predominantly remain in FAR condition (Section 3.4.4.3.1). Healthy and viable populations of spotted frogs depend on properly functioning wetland and riparian areas. Effects would be long-term (10 years) and riparian habitat would continue to be degraded as it has been under current management.

Pygmy rabbit

Under Alternative 1, condition in upland habitats is not expected to improve or deteriorate due to continuation of current livestock grazing management; therefore, in areas unaffected by juniper encroachment, big sagebrush cover and forage for pygmy rabbits would remain similar to current conditions. However, juniper encroachment in pastures 2 and 3 would continue to degrade pygmy rabbit habitat by reducing forage and big sagebrush cover. In addition, the effects of grazing under Alternative 1 would continue habitat deterioration for many small to medium herbivores, including pygmy rabbits in riparian areas. Because small and medium herbivores, including pygmy rabbit, play an important role in predator-prey relationships, actions that reduce numbers of these species can have cascading effects to the food web.

Columbia River redband trout

Under Alternative 1, riparian areas within the allotment will continue to receive heavy use. Heavy use of riparian areas has been shown to degrade fish habitat (US GAO, 1988) (Elmore & Kauffman, 1994) (McInnis & McIver, 2009). When riparian areas are heavily utilized, similar to current grazing management levels, effects to fish habitat include increased levels of surface fines, increased width-to-depth ratios, loss of cover, and reduced stream shading. Surface fines degrade spawning substrates and reduce reproductive success. Fines can suffocate eggs or trap newly hatched fry in the substrate. Direct effects from cattle trampling redds while eggs or fry are present may occur in the form of mortality. Increased width-to-depth ratios lead to simplified channels, which reduces hiding cover and leads to warmer water. Loss of overhead cover increases exposure to sunlight, which also reduces hiding cover and increases water temperatures. Loss of hiding cover increases the likelihood that individual redband trout will be preyed upon, and increased water temperatures are likely to result in decreased survival of individual redband trout.

Under Alternative 1, habitat for redband trout and other fish species would remain in a deteriorated condition in streams within the allotment boundaries and for several miles downstream of the allotment (Section 3.4.4.3.1). Bank trampling, reduced macroinvertebrate diversity and numbers, loss of desirable riparian vegetation, increased sedimentation, and reduced overhead cover would negatively affect redband trout and other fish species. As a result, the prey base for redband would decrease, sediment would likely suffocate or entomb incubating eggs and emerging fry, and reduced overhead cover would likely increase predation on redband trout. Without deep-rooted riparian vegetation, streams would be more susceptible to degradation from livestock and high water events. There would be a loss of habitat complexity important for redband trout such as fewer pools, undercut banks, and woody debris, which would likely result in increased vulnerability to predation. Width-to-depth ratios also would increase, which means streams would become wider and shallower. Wide, shallow streams provide less suitable habitat for redband trout, and would likely result in decreased survival. Juniper would increase in riparian areas leading to lowered water table, reduced groundwater recharge, and changes to nutrient cycling (Huxman, et al., 2005) (Deboodt, Fisher, Buckhouse, & Swanson, 2009). Effects to redband trout and other fish species would be long-term and potentially last for more than 10 years because the degraded condition would continue through the term of the permit.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Grazing management under Alternative 1 is not expected to either improve or deteriorate bird habitat conditions in the uplands. However, riparian habitats would remain in a degraded condition for many bird species in the allotment including special status species such as calliope hummingbird and willow flycatcher. Birds generally do not respond to the presence of grazing livestock but to the effects on vegetation from grazing (Bock & Webb, 1984). Research has shown that livestock grazing can cause a decline in habitat for bird species by altering vegetative structure and habitat complexity, reducing cover, diversity, native vegetation, and forage, and spreading weeds and undesirable annuals (Mosconi & Hutto, 1982) (Taylor D. M., 1986) (Bock, Saab, Rich, & Dobkin, 1993) (Riparian Habitat Joint Venture, 2004). The loss of canopy structure at various heights affects nesting habitat and increases the likelihood of predation and nest parasitism. The loss of grasses and forbs affects species that forage on seeds and insects.

Research has demonstrated that riparian area grazing has an effect on migratory bird species richness; for many species, as grazing increases, species richness decreases (Taylor D. M., 1986) (Krueper, Bart, & Rich, 2003) (Earnst, Ballard, & Dobkin, 2005). An evaluation of the effects of moderate levels of grazing on migratory birds' breeding in riparian areas found positive effects for Brewer's blackbird and Lewis' woodpecker, negative effects for calliope hummingbird and willow flycatcher, and mixed or uncertain response by red-naped sapsucker (Bock, Saab, Rich, & Dobkin, 1993). Grazing effects on riparian habitat specialists tend to be greater than on habitat generalists (Bock, Saab, Rich, & Dobkin, 1993). Maintenance of and improvements in structural diversity and herbaceous understory cover in riparian-wetland areas are not expected to occur under the heavy utilization levels that are expected in these areas under Alternative 1. The continuation of the current poor conditions in riparian areas could result in lower nesting densities and success, higher rates of nest parasitism, and decreased foraging habitat.

Species preferring woodland habitat would continue to benefit from the abundant woodlands and would be affected little by grazing management within the allotment under Alternative 1. However, woodland species that also forage in grass, shrub, or riparian-wetland habitats would be affected accordingly by impacts to those habitats, as discussed above. In addition, as juniper woodlands attain later seral stages of development (i.e., phase 3), soils become drier and understory forbs, shrubs, and grasses decline, reducing suitable habitat and habitat diversity for birds (Miller, Bates, Svejcar, Pierson, & Eddleman, 2005).

Raptor species that prefer forest habitat such as northern goshawk and flammulated owl may benefit from increasing juniper until expansion resulted in a decrease in prey numbers. Effects of grazing on raptors would mainly result from effects to habitat of prey species. Conditions for prey species in upland habitats are expected to neither improve nor deteriorate from current conditions and prey species populations, more than likely, would remain relatively static. However, under Alternative 1 prey species (i.e., primarily rodents and voles) found in riparian areas most likely would decline as these areas deteriorate due to excessive removal of herbaceous plant biomass and the subsequent lack of litter accumulation from heavy and prolonged livestock use. Reduced numbers of prey can influence reproductive efforts and success of raptors. For instance, golden eagles lay fewer eggs or do not breed during years when jackrabbit numbers are low and lay more eggs and produce more young when jackrabbit numbers are high (Steenhof, Kochert, & McDonald, 1997). Although livestock may disturb or trample ground nests of northern harriers and short-eared owls, these incidents more than likely would be rare and isolated under the stocking rates of Alternative 1. Burrowing owls might be disturbed by cattle, but their nests are protected from trampling by being deep in burrows and effects to reproductive success due to the effects of livestock grazing would be negligible.

Big Game and other Mammals (including Special Status Species)

The proposed timing and level of grazing under Alternative 1 would reduce forage and cover in riparian areas, while neither improving nor deteriorating conditions in the uplands. Riparian areas are extremely important for deer and elk foraging particularly in the fall, and as fawning and calving habitat in the spring. In general, livestock grazing is a competitive action with other herbivores that reduces available forage and reduces cover and habitat structure needed by smaller herbivores (Medin & Clary, 1989) (Schulz & Leininger, 1990) (Hayward, Heske, & Painter, 1997). Effects of livestock grazing on big game and mammals under Alternative 1 would include reduced amounts of forage (e.g., grasses, forbs), browse (e.g., willows, sagebrush, bitterbrush, mountain mahogany), and protective cover. These effects could lead to lower winter survival due to a reduction of high-quality forage that deer and elk require in order to build up winter fat reserves. A reduction in cover could expose fawns and elk calves to greater predation and increase mortality rates. In addition, population numbers for deer and elk probably have been affected to some degree by poor habitat conditions due to historic grazing practices. Because elk have the competitive advantage over mule deer, effects to deer populations probably would be greater (Mule Deer Working Group, 2004).

Under Alternative 1, habitat conditions for bighorn sheep would most likely remain similar to current conditions because upland habitat are not expected to improve or deteriorate over the term of the permit. Additionally, because bighorn sheep typically select habitats in rugged terrain and on steep slopes within the canyons adjacent to pastures 3 and 4, there is very little spatial overlap and resource competition with cattle. Grazing management under Alternative 1 is expected to have negligible effects on the local bighorn sheep population and their canyon habitats.

3.4.5.2.2 Alternative 2 Effects

An increase in the level of livestock use in comparison to Alternative 1 as proposed in the permittees' applications would reduce forage and cover for wildlife in uplands and riparian areas, lead to trampling and breakdown of stream banks, lead to reduced numbers and vigor of native plant species from consumption and trampling, increase sediment into streams, and allow invasive plant species to outcompete native species due to reduced vigor in the latter (Sections 3.4.1.2.2 and 3.4.4.3.2). Habitat conditions for wildlife and fish populations in the allotment would deteriorate in comparison to Alternative 1 because periodic rest of pastures would not occur, pastures 2, 3, 4, and 5 would be grazed annually during the growing season (frequently during the critical growing season), and riparian areas in pastures 1 and 6 would be grazed during the hot season. These factors deteriorate wildlife habitats because they decrease the ability of native plant communities to remain healthy, vigorous, and productive, and provide adequate forage and cover for wildlife species. Because improvements in habitat conditions are not expected and a deterioration of habitats is likely in upland and riparian communities, Standard 8 (Threatened and Endangered Plants and Animals) would not be met under Alternative 2.

Focal Special Status Animal Species

Greater sage-grouse

Effects to sage-grouse from livestock grazing under Alternative 2 are similar to those identified in Alternative 1 with the following differences. Effects would likely occur to a greater magnitude in comparison to Alternative 1 because a 42 percent increase in AUMs would be authorized, and growing and hot-season use would continue in upland and riparian areas without the benefit of periodic rest. The positive effects to sage-grouse from livestock grazing discussed above in Alternative 1 would not occur with the proposed increase to moderate and above grazing use levels. Negative effects of livestock grazing on sage-grouse would be more pronounced under Alternative 2 and would include an increased potential for trampling of eggs and subsequent nest desertion, degradation, loss, and avoidance of formerly suitable habitat caused by deteriorated wet meadow hydrology, heavily grazed meadows in poor condition, and introduction of non-native weeds.

Under Alternative 2, perennial herbaceous vegetation heights at the beginning and end of the nesting season in pastures 2 and 4 are expected to be shorter than those expected under Alternative 1 (i.e., at times fewer than 9 and 5 inches, respectively). Average perennial herbaceous vegetation heights of fewer than 7 inches that could consistently result from grazing under Alternative 2 would not provide adequate nesting cover in pastures 2 and 4 in most years. In addition, the moderate to heavy utilization levels (i.e., 41 to 60 percent *sensu* (Holechek, Baker, Boren, & Galt, 2006)), frequent growing season use, and lack of rest that are likely to occur with implementation of Alternative 2 would not be adequate for the maintenance of vigorous and healthy perennial bunchgrass and rangeland vegetation which contribute to suitable sage-grouse habitat conditions.

Because implementation of Alternative 2 does not institute any practical measures for the conservation of special status species and would degrade sage-grouse nesting habitat by reducing perennial herbaceous cover below suitable heights (i.e., ≥ 7 inches) and allow frequent and prolonged grazing in PPH-sagebrush during the breeding season, which could result in increased trampling of eggs and nest failure, and continue degradation of sage-grouse brood-rearing habitats due to continued deteriorated wet meadow hydrology, invasion of xeric species, and lack of herbaceous vegetation for forage, this alternative is not consistent with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular, "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

<u>Columbia spotted frog</u>
Effects to spotted frogs from livestock grazing under Alternative 2 are similar to those identified in Alternative 1 with the following differences. Negative effects to spotted frog habitat would likely occur to a greater magnitude in comparison to Alternative 1 because of increased AUMs and use levels, and continued hot-season use in riparian areas. Habitat for spotted frogs would continue to deteriorate from loss of cover, degraded aquatic habitat, and reductions of prey items.

<u>Pygmy rabbit</u>
Moderate to heavy stocking rates similar to those expected under Alternative 2 can increase the potential for livestock trampling effects such as reduced shrub cover and collapse of pygmy rabbit burrows (Siegel Thines, Shipley, & Sayler, 2004) (Hagar & Lienkaemper, 2007). The effects of grazing under Alternative 2 would continue habitat deterioration for many small to medium herbivores including pygmy rabbits.

<u>Columbia River redband trout</u>
Grazing effects to redband trout and fisheries under Alternative 2 would be similar to those identified in Alternative 1 but would occur at a greater magnitude due to higher livestock numbers, utilization levels, and concentrated livestock use in riparian areas during summer. Alternative 2 would result in continued degradation of fisheries habitat.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Effects to birds from livestock grazing under Alternative 2 are similar to those identified in Alternative 1. However, effects would occur at a greater magnitude and affect additional species under Alternative 2 because many species dependent on herbaceous ground cover for nesting and/or foraging are negatively affected by moderate to heavy levels of livestock grazing (Bock, Saab, Rich, & Dobkin, 1993). Habitat for most bird species in the allotment, including special status species such as calliope hummingbird and willow flycatcher, would remain in a degraded condition particularly in riparian areas. Effects of Alternative 2 include reduced cover of grasses and forbs, reduced nesting habitat, increased non-native grasses and forbs, reduced forage, simplified structural diversity, and disturbance to foraging activities.

Heavy livestock grazing, as is expected on portions of the allotment under Alternative 2, has been shown to degrade sagebrush and shrub steppe habitat to the detriment of sagebrush-obligate species (Braun, Baker, Eng, Gashwiler, & Schroeder, 1976) (Paige & Ritter, 1999). Specifically, heavy grazing reduces native perennial grass and forb cover, vegetative structure, suitable nest sites, and increases non-native grasses and promotes juniper expansion. Research on bird species in shrub steppe habitats found differing responses to moderate levels of grazing (Bock, Saab, Rich, & Dobkin, 1993). Based on the results of this study, special status and migratory bird species that would be negatively affected by Alternative 2 include Brewer's sparrow, grasshopper sparrow, Swainson's hawk, short-eared owl, and burrowing owl. Brewer's blackbird, black-throated sparrow, loggerhead shrike, and sage thrashers demonstrated mixed or no responses (Bock, Saab, Rich, & Dobkin, 1993). However, Bock and Webb (1984) found that some species that prefer open habitat responded positively to grazing. In the sagebrush steppe communities, several species are thought to respond positively to upland grazing at moderate levels including golden eagle and sage sparrow. These positive effects could occur in areas of moderate use; however, in areas of heavy use, effects could begin negatively affecting these species. Species such as Brewer's blackbird and Lewis' woodpecker that use riparian as well as other open habitat types would probably benefit from moderate to heavy utilization. While these species are often found in riparian areas, they are not restricted to them and can be found in a wide variety of habitats. Effects to woodland-associated bird species from livestock grazing under Alternative 2 are the same as those discussed in Alternative 1.

Grazing effects to raptors under Alternative 2 would be similar to those identified in Alternative 1. Prey including small rodents, birds, and reptiles would decrease from loss of cover and forage under the moderate to heavy use levels expected under Alternative 2. These effects would be observed while grazing at the applicants' proposed use levels and would affect raptors that are within foraging range of the allotment. Ground-nesting raptors, including northern harriers and short-eared owls, would experience reduced amounts of suitable nesting cover and potentially higher incidence of nest trampling on an annual basis from grazing.

Big Game and other Mammals (including Special Status Species)

Grazing effects to big game and other mammals under Alternative 2 would be similar to those identified in Alternative 1, with the following differences. The moderate to heavy levels of utilization expected under Alternative 2 would have detrimental effects to big game species because intensive livestock grazing on browse species can reduce critical winter food supplies for deer and elk. Grazing use levels under Alternative 2 also would increase resource partitioning and probably result in spatial displacement of deer and elk from areas used by cattle (Stewart, Bowyer, Kie, Cimon, & Johnson, 2002).

3.4.5.2.3 Alternative 3 Effects

Under Alternative 3 substantial improvements to wildlife habitat in upland and riparian areas would be realized over the term of the permit. Implementation of Alternative 3 would include performance-based terms and conditions that were developed to protect and enhance native plant communities in the uplands and riparian areas, and breeding, brood-rearing, and foraging habitats for sage-grouse and other upland and riparian wildlife species (Table ALT-1). In addition to the terms and conditions discussed in Sections 3.4.1.2.3 and 3.4.4.3.3 (#13 and #14, respectively) which would benefit upland and riparian breeding, nesting, and foraging habitats for migratory birds, pygmy rabbits, spotted frogs, redband trout, and other wildlife species, the term and condition in Alternative 3 specific to sage-grouse breeding habitat (#15) include a perennial herbaceous vegetation minimum height requirement in PPH-sagebrush in pastures 2 and 4 (where usable nesting habitat currently exists). Compliance with the term and condition would provide suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season.

Under Alternative 3, upland wildlife habitat would improve in comparison to current conditions because compliance with the short-term indicator of limiting utilization of key forage species to levels less than or equal to 20 percent would allow for the recovery and maintenance of healthy, vigorous, and productive perennial bunchgrasses and native rangeland vegetation communities. Healthy vegetation communities provide the structure (e.g., physical patterns of life forms, individual physiognomy), function (e.g., energy flow, nutrient cycling), and composition (e.g., genetic, species, and ecosystem diversity) many wildlife species require to maintain robust and viable populations. Additionally, riparian wildlife habitat would improve substantially for dependent species (e.g., migratory birds, spotted frogs, and redband trout) under Alternative 3 in comparison to current conditions because compliance with short-term indicators would maintain an herbaceous stubble height of at least 6 inches, a riparian shrub use level less than 30 percent, and limit bank and lentic edge alteration (less than 10 percent and less than 20 percent, respectively), thereby providing greater structural diversity and cover for wildlife species to nest, breed, forage, and conceal themselves. Recovery of wildlife habitat within the allotment could occur in the short term (depending on the current degradation and ecological resiliency of the site) and would continue through the term of the permit; significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Under Alternative 3, upland and riparian areas throughout the allotment would improve in quality in comparison to Alternative 1, primarily due to an increase in perennial herbaceous cover (which provides greater concealment cover and protection from predators) and an overall improvement in vegetation community health and composition. Specifically, sage-grouse nesting habitat quality in upland areas of pasture 2 and 4 would improve in comparison to Alternative 1 because average perennial herbaceous vegetation height would be required to exceed 7 inches, thus ensuring a critical component of suitable nesting habitat throughout areas of PPH-sagebrush within these pastures. These improvements would be the direct result of compliance with the performance-based terms and conditions (#12-#15). Improvements to sage-grouse brood-rearing habitat stability and forage availability and nesting cover would primarily result from compliance with performance-based terms and conditions #14 and #15 (average riparian herbaceous stubble height of at least 6 inches and average perennial herbaceous vegetation heights of at least 7 inches, respectively); whereas compliance with performance-based term and condition #13 (limit growing season utilization at less than or equal to 20 percent) would improve brood-rearing and summer habitats by allowing for healthy, vigorous, and diverse vegetation communities that could provide an abundance of prey (i.e., insects) and forage species. In addition, compliance with performance-based term and condition #13 potentially could increase concealment cover indirectly if utilization limits increase the quantity and vigor of desirable deep-rooted, tall-structured bunchgrasses which under typical growing conditions would likely result in average perennial herbaceous vegetation heights over 7 inches.

Grazing under Alternative 3 could occur during the critical growing season every other year in pasture 2 and 2 out of 3 years during the growing season in pasture 4. However, because utilization would not exceed 20 percent in pasture 4 due to compliance with term and condition #13, perennial bunchgrasses and upland vegetation communities would have the opportunity to recover from current conditions and increase in vigor over the short term (3 to 5 years). On the other hand, because utilization could reach 50 percent in pasture 2 every other year when it was grazed during the critical growing season, recovery of perennial bunchgrasses and upland vegetation communities would occur slower (primarily due to periodic rest) but could occur over the term of the permit.

Implementation of Alternative 3, with its performance-based terms and conditions specifically targeted at improving specials status species (i.e., migratory birds, sage-grouse, spotted frog, redband trout, sage sparrow, loggerhead shrike, spotted bat, etc.), and their habitats in particular, complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular “to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

<u>Columbia spotted frog</u>
Under Alternative 3, spotted frog habitat is expected to improve in comparison to Alternative 1 because herbaceous and woody cover in riparian areas would be more abundant, which could result in greater site stability and better water quality. Herbaceous and woody cover would increase because livestock use of riparian areas is expected to be lower due to implementation of limits to herbaceous stubble heights and woody species use as per term and condition #14. Since banks would be stable and vegetated along streams and vegetation within spring areas would increase, erosion would decrease and spotted frog habitat quality would improve. Nevertheless, direct effects to spotted frog habitat due to periodic spring use in pastures 2, 3, and 5 could include trampling of adult frogs and egg masses, disturbed aquatic habitat, and reductions of prey items during the breeding season.

<u>Pygmy rabbit</u>
Under Alternative 3, habitat conditions for pygmy rabbits and other small to medium herbivores such as mice, voles, and jackrabbits would improve in comparison to Alternative 1. Compliance with terms and conditions #13 and #15 would result in improvements to perennial bunchgrasses and sagebrush communities and limits on live and residual herbaceous vegetation heights would enhance cover throughout the allotment for these species, especially in riparian areas. There also would be more forage available from spring through late summer when pygmy rabbit herbivory of grasses and forbs occurs; reproduction and population recruitment would likely increase due to lower predation rates resulting from greater concealment cover and a greater abundance of forage species. Nevertheless, direct effects to pygmy rabbits in pasture 2 potentially could include trampling of shrub cover, collapse of natal burrows and burrow complexes, and soil compaction during the breeding season.

<u>Columbia River redband trout</u>
Under Alternative 3, habitat for redband trout and other fish species would improve in streams in comparison to Alternative 1 because compliance with term and condition #14 would translate into more woody and herbaceous vegetation, and less streambank trampling (Section 3.4.4.3.3). Increased vegetation would result in improved hiding cover which would reduce predation on redband trout and increase macroinvertebrate prey availability, both of which would likely increase redband survival. Because use in pasture 6 would occur for a short duration in the late summer and fall, the direct effects of livestock on spawning would not occur. Shade and cover would improve and there would be an increase in stream channel characteristics including pools, undercut banks, and habitat complexity that would improve in-stream habitat for fish compared to Alternative 1. Improvements to in-stream habitat would decrease predation on redband trout and increase refuge areas during high water events resulting in increased survival. Sediment levels probably would be reduced, making gravel areas more suitable for spawning which would likely increase egg-to-fry survival and create better habitat for macroinvertebrates which would increase the prey base for redband trout. Conditions for fish populations downstream of the allotment boundaries also would improve due to reduced sediment loads and lower water temperatures from inflowing streams.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Under Alternative 3, habitat for many bird species in the allotment, especially species associated with riparian areas, would experience improvements in comparison to Alternative 1. Compliance with terms and conditions #13-15 would increase cover in upland and riparian areas overall and would provide improvements in nesting and foraging substrates and cover. Habitat structure and complexity from the current season of growth would be improved. An increase in structural complexity of woody species and the herbaceous understory in riparian areas due to compliance with term and condition #14 would provide greater nesting and foraging opportunities because of an increase in cover and prey. Increases in herbaceous vegetation density are associated with increases in species richness and relative abundance, especially in Neotropical migrants (Dobkin, Rich, & Pyle, 1998). Forage would likely be more abundant and reproductive success probably would increase. In turn, nesting success and populations would increase over the term of the permit as heavily impacted riparian areas along most reaches of streams would recover and afford adequate bird habitat that currently is absent. Light utilization of herbaceous and browse species in riparian areas that is expected with compliance with term and condition #14 would increase nest-screening cover. Reproductive efforts would not be disturbed by livestock or management activities during the spring breeding season in most lotic riparian areas along perennial streams. Similar to Alternative 1, disturbance to nesting birds in most riparian areas would not occur, as pastures 1, 5, and 6 would be grazed in the summer and fall after most migratory bird breeding is completed.

Potential effects to birds from early livestock use in upland habitats in pastures 2, 3, and 4 (shrub steppe in particular) could include disturbance to nesting and foraging activities, and trampling of nests at the onset and during the early breeding season. However, compliance with terms and conditions #13 and #15 would result in improvements to perennial bunchgrasses and sagebrush communities and limits on live and residual herbaceous vegetation heights would enhance cover for most shrub steppe-obligate and -dependent species. Raptors would benefit from improved habitat conditions and increased levels of prey species. Effects to most raptors would be minimal as the territories of most species extend beyond the allotment boundaries. Raptor reproduction probably would increase over time as conditions improved for prey species across the allotment. The early season of use in pastures 2, 3, and 4 would expose ground-nesting raptors to a risk of trampling. However, on average, compliance with terms and conditions #13-15 would result in increased nesting cover and improvements in vegetation communities overall.

Big Game and other Mammals (including Special Status Species)

Under Alternative 3, habitat for big game, particularly deer and elk, would improve in comparison to Alternative 1. Bighorn sheep habitat and effects to the species would be the same as those identified under Alternative 1. The amount of upland forage and cover would increase, and use of browse species in riparian areas would be less because of the utilization and stubble height limits due to compliance with terms and conditions #13-15. Light use of riparian areas would increase cover for deer fawns and elk calves during spring and summer months. Beaver colonization would be possible in the long term (more than 10 years) because riparian habitat would improve by providing more woody material for beavers to engineer their environment (Section 3.4.4.3.3). Herbivores would benefit from the increase in cover and forage throughout the allotment due to larger quantities of the current year's growth. However, displacement between livestock and big game would continue in riparian areas as late summer and fall use would continue in pastures 1 and 6. Competition may cause displacement of deer and elk during a time when it is important to build up winter fat reserves.

3.4.5.2.4 Alternative 4 Effects

With respect to wildlife, Alternative 4 would provide substantial benefits in comparison to Alternative 1. Specifically, wildlife habitat in upland and riparian areas would improve throughout the allotment to a greater extent in comparison with Alternative 1 due to a reduction in AUMs, an overall increase in acres/AUM, changes in season of use, and the potential for periodic rest and deferment. Utilization levels are expected to decrease and likely result in greater forage and cover for wildlife due to a reduction in AUMs which would result in an overall increase in acres/AUM. Changes in season of use in some pastures would result in fewer disturbances to breeding activities in uplands and riparian areas in comparison to Alternative 1. Periodic rest and/or deferment in most of the pastures in conjunction with changes in seasons of use in pastures with riparian areas (1, 5, and 6) and sage-grouse breeding habitat (pasture 4 in particular) would favor improvements in vegetation community composition, structure, and overall health. The subsequent increase in cover and forage for wildlife in upland and riparian areas (Section 3.4.1.2.4 and 3.4.4.3.4) are expected to occur over the short term (3 to 5 years) and the term of the permit. Habitats are expected to recover and improve and significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

Greater sage-grouse

Under Alternative 4, sage-grouse habitat quality in upland and riparian areas in pastures 2 and 4 would improve in comparison to Alternative 1, primarily due to a reduction in AUMs, changes in season of use, and the potential for periodic rest and deferment. Although pasture 2 would continue to be grazed during the growing season, cattle would be moved before the end of the growing season, which would provide an opportunity for 30 to 60 days of regrowth and avoid grazing during the critical growth period every other year. However, grazing would occur during the nesting season, and direct impacts such as trampling of eggs and nests and subsequent nest abandonment could still potentially occur, although infrequently, as discussed previously. Within pasture 2, the early spring season of use and reduction in AUMs would provide the greater benefits to sage-grouse habitat in comparison to Alternatives 1 and 2. Brood-rearing habitat in meadows and riparian areas are expected to improve in comparison to Alternative 1 because livestock grazing is more likely to occur in upland habitat during spring use, sparing riparian areas of the heavy use they currently experience. Because wetland and riparian areas would incur less use, herbaceous vegetation and woody species would have the ability to increase and provide better site stability, more forage, and greater concealment cover for sage-grouse and their broods.

Under Alternative 4, based on past actual use records, pasture 2 would be grazed every other year for half as long as it currently has been (Appendix B, Table B-1). In comparison with grazed years in Alternative 1, this level of use in pasture 2 under Alternative 4 would result in an AUM reduction of more than 30 percent when grazed from 4/15 to 5/31 and 75 percent when grazed from 4/15 to 4/30. Following the rationale that fewer AUMs likely results in taller average perennial herbaceous vegetation heights, perennial herbaceous vegetation heights are expected to conform with recommended guidance (Connelly, Schroeder, Sands, & Braun, 2000) and average more than 4 and 7 inches at the beginning and end of the nesting season, respectively. Based on historical utilization data for pasture 2 (approximately 35 percent or conservative use *sensu* (Holechek, Baker, Boren, & Galt, 2006)), utilization is expected to remain at the conservative level or less (i.e., less than or equal to 35 percent), considering the 30 to 75 percent reduction in AUMs in the pasture; light to conservative use is consistent with improving native perennial plant health and vigor (Holechek, Gomez, Molinar, & Galt, 1999) which would correspond with greater sage-grouse nesting and concealment cover in comparison to Alternative 1. These changes could improve nesting success and juvenile survival and potentially lead to population increases.

Under Alternative 4, sage-grouse habitat conditions in pasture 4 also would improve in comparison to Alternative 1. Grazing would not occur in pasture 4 during the lekking and nesting season, which would eliminate potential direct effects of livestock to sage-grouse nests and eggs, such as displacement from leks, trampling of eggs and nests, and subsequent nest desertion. Under Alternative 4, grazing use would be deferred annually in pasture 4 and therefore would not occur during the growing season. In addition, in the absence of cattle grazing, nesting concealment cover and early brood-rearing forage would not be actively removed during the breeding season, which would result in an increase in protective cover and forage in comparison to Alternative 1. Deferment in pasture 4 would also result in improvements to perennial bunchgrasses and rangeland vegetation communities because removal of leaves and tillers would occur after the growing season when most perennial herbaceous plant species are dormant and impacts have less effect on the health of the plants (Section 3.4.1.2.4). Over the term of the permit, vegetation community composition, structure, and health would improve overall in the absence of growing season use, resulting in an increase in abundance and vigor of perennial bunchgrass, and thus, increased protective cover for nesting sage-grouse. In addition, due to typical annual variations in water availability, pasture 4 could be rested 7 out of 10 years over the term of the permit.

Under Alternative 4, based on past actual use records, pasture 4 could be grazed for an average of 17 days in July (Appendix B, Table B-1). This use would result in a reduction of more than 60 percent in AUMS and stocking rate for pasture 4 in comparison to Alternative 1. Because perennial herbaceous vegetation heights are expected to average more than 5 inches at the beginning and end of the nesting season under current conditions, under the reductions associated with Alternative 4, perennial herbaceous vegetation heights are expected to conform with recommended guidance (Connelly, Schroeder, Sands, & Braun, 2000) and average more than 4 and 7 inches at the beginning and end of the nesting season, respectively. Based on historical utilization data for pasture 4 (approximately 20 percent, or light use *sensu* (Holechek, Baker, Boren, & Galt, 2006)), continued light use or less would be expected with a 26 percent reduction in AUMs across the allotment overall; light use, deferment, and periodic rest would result in improved native perennial plant health and vigor and improvements in sage-grouse nesting and concealment cover in comparison to Alternative 1. Collectively, these changes could improve nesting success and juvenile survival and potentially lead to population increases.

Implementation of Alternative 4, with its attendant reduction of AUMs and change in season of use specifically targeted at improving riparian habitats for special status species and riparian-associated wildlife and sage-grouse nesting habitat, complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

<u>Columbia spotted frog</u>
Because riparian areas and water quality are expected to improve (Section 3.4.4.3.4), benefits to spotted frog habitat would be similar to those discussed for Alternative 3.

<u>Pygmy rabbit</u>
Because shrub steppe habitat in pastures 2 and 4 are expected to improve under Alternative 4 as discussed in the sage-grouse section above, cover and spring forage for pygmy rabbits would also improve in comparison to Alternative 1.

<u>Columbia River redband trout</u>
Under Alternative 4, habitat for redband trout and other fish species would improve in streams in comparison to Alternative 1 (Section 3.4.4.3.4). However, potential effects to fish due to an early season of use in pasture 6 every other year, in comparison to Alternative 1, could include bank trampling, reduced macroinvertebrate diversity and numbers, loss of desirable riparian vegetation, increased sedimentation, and reduced overhead cover. However, these effects are only expected 5 out of 10 years.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Compared to Alternative 1, habitat for many bird species in the allotment, especially species associated with riparian areas, would experience substantial improvements under Alternative 4. The benefits from the absence of or limited hot-season use compared to Alternative 1 would improve bird habitats in riparian areas over the term of the permit. Obligate and dependent species, including migratory birds and special status species, using the shrub steppe and grassland habitats in pastures 2, 3, and 4 would be benefitted by eliminating disturbance due to livestock grazing during the breeding season in years of deferment. However, potential effects to birds in pastures 2 and 3 during years with spring livestock use include reduced cover of grasses and forbs, disturbance to breeding, nesting, and foraging activities, and trampling of nests. Effects to most raptors would be minimal, as the territories of most species extend beyond the allotment boundaries. Under Alternative 4, habitat improvement for raptor prey species and consequently raptors would be similar to those discussed previously for Alternative 3.

Big Game and other Mammals (including Special Status Species)

Under Alternative 4, habitat for big game would improve over current conditions. The amount of upland forage and cover most likely would be similar to Alternative 3 in pastures 2 and 3 in years that they are grazed during the growing season, while effects to browse species in riparian and mountain shrub areas in pastures 1 and 6 would be substantially reduced due to the early season of use or short duration during hot-season use in comparison to Alternative 1. Although early-season use of riparian areas (every other year) could slightly decrease cover for deer fawns and elk calves, effects would be negligible, particularly in pasture 6, as most parturition would have taken place earlier in the season (i.e., May versus June). However, riparian areas would provide adequate forage for big game in pastures 1 and 6 during years of limited-duration hot-season grazing in comparison to Alternative 1. Conditions in riparian areas are expected to improve (Section 3.4.4.3.4) in 3 to 5 years, and beaver colonization could be possible over the term of the permit. Under Alternative 4, there would be fewer effects to deer and elk from resource partitioning because of the limited summer use in riparian areas compared to Alternative 1. Bighorn sheep habitat and effects to the species would be the same as those identified under Alternative 1.

3.4.5.2.5 Alternative 5 Effects

Extended rest would dramatically improve conditions for all species of wildlife throughout the Castlehead-Lambert allotment. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. In general, all of the negative effects associated with grazing identified in this EA would cease across the allotment. Wildlife habitats would recover and improve over the term of the permit or sooner, especially in aquatic and riparian-wetland areas with the absence of the effects due previous annual hot-season cattle grazing. Overall, the allotment would become much more diverse and productive as wildlife habitats improved and population numbers for most species increased. Terrestrial and aquatic wildlife habitat objectives would be met and there would be substantial progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals), although recovery of some degraded habitats could take 5 to 20 years.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Under Alternative 5, sage-grouse would benefit from the removal of livestock from the allotment because the negative effects of livestock grazing would no longer occur to the species or their habitat. Potential negative effects of livestock grazing on sage-grouse include trampling of eggs and subsequent nest desertion, and degradation, loss, and avoidance of formerly suitable habitat (Beck & Mitchell, 2000). With the removal of livestock, nesting structure and cover are expected to increase in uplands, along with a similar increase and improvement of late brood-rearing habitat in meadows and riparian areas. Sage-grouse have been shown to select brood-rearing habitat with taller grasses and increased herbaceous cover; increased herbaceous biomass is correlated with invertebrate prey abundance, and the increased vertical and horizontal cover it affords most likely imbues greater protection from predators, both of which could increase juvenile survival (Kaczor, et al., 2011). Under Alternative 5, improved habitat conditions could result in higher nesting success, juvenile survival, and productivity, which could increase local population numbers.

Because implementation of Alternative 5 would exclude livestock disturbance and all associated impacts from more than 45,000 acres within the allotment (including 10,000 acres of PPH-sagebrush) and establish a landscape-sized refuge for migratory birds, a multitude of special status species, and an identified sage-grouse subpopulation stronghold in an otherwise increasingly inhospitable matrix of degraded habitat, the alternative complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Columbia spotted frog

Under Alternative 5, spotted frogs would benefit from the removal of livestock because riparian habitat would improve substantially (Section 3.4.4.3.5). Improvements to spotted frog habitat include increased levels of high emergent vegetation cover and lack of livestock trampling effects. An increase in suitable breeding areas could lead to greater reproductive output, and an increase in cover in the form of aquatic vegetation has been shown to lead to greater survival of offspring (Bull & Hayes, 2000) and concomitant increases in population numbers would be expected.

Pygmy rabbit

Removal of livestock grazing would improve habitat conditions for pygmy rabbits in a variety of ways under Alternative 5. An increase in quantity and improvement of species composition of grasses (particularly native perennial bunchgrasses) and forbs would provide more and higher-quality spring and summer forage (Siegel Thines, Shipley, & Sayler, 2004). In addition, a reduction of soil compaction and burrow collapse and an increase in use (as determined by burrows per unit area) would be expected with removal of livestock (Siegel Thines, Shipley, & Sayler, 2004).

Columbia River redband trout

Under Alternative 5, habitat conditions for redband trout would improve because stream channels would not be degraded by livestock grazing. Habitat features such as pools, undercut banks, and overhead cover, which are critical to redband production (Muhlfeld & Bennett, 2001), are expected to increase under Alternative 5. Herbaceous and woody plant vegetation would return and increase along streambanks, creating greater stabilization which would reduce sediment inputs and lead to improved channel conditions. Increased shade and reduced sediments would also improve aquatic habitat by lowering stream temperatures which has been shown to increase density and biomass of redband trout (Lamberti, Pearsons, Tait, Li, & Buckhouse, 1994) (Tait, Li, Lamberti, Pearsons, & Li, 1994) (Zoellick, 2004). As habitat improves, the numbers of redband trout is expected to increase over the term of the permit.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Under Alternative 5, birds would benefit because of the increased productivity of all habitat types they utilize, especially riparian areas. Springs would improve and expand and streams would eventually experience widening riparian areas, resulting in increased levels of riparian habitat for obligate and dependent species across the allotment. Bird diversity and numbers increase when livestock are removed from an area (Taylor & Littlefield, 1986) (Bock, Saab, Rich, & Dobkin, 1993) (Dobkin, 1998) (Krueper, Bart, & Rich, 2003) (Earnst, Ballard, & Dobkin, 2005) (Earnst, Dobkin, & Ballard, 2012). Nesting structure and cover would increase and lead to greater reproductive success and improved population numbers. Improved habitat conditions under Alternative 5 also would benefit all raptor species; nesting conditions would improve and prey numbers would increase, leading to greater levels of successful reproduction and survival of offspring.

Big Game and other Mammals (including Special Status Species)

All mammals and big game species would benefit from removal of livestock from the allotment under Alternative 5. There would be more available forage for all herbivorous species and increased levels of protective cover. Desirable perennial bunchgrass and forb species would increase over time and competition between cattle and other herbivores would not occur. Population numbers of big game and other herbivores would be expected to increase. Livestock trampling of cover and collapse of burrows would not occur. Willow and aspen would be expected to increase across the allotment at suitable sites. This most likely would lead to increased numbers of beaver in the area and lead to habitat creation or improvements for many species, including spotted frog and redband trout.

3.4.5.3 Cumulative Effects

Scope

The area considered for cumulative effects can vary greatly by species and their distribution across the landscape. Given the current conservation importance of greater sage-grouse, it is logical if not imperative to choose an analysis area that is biologically relevant to the species. The greater sage-grouse is an upland game-bird species that utilizes sagebrush habitats at multiple spatial scales. Stiver et al. (2010) described four orders of habitat selection for sage-grouse, from broad- to site-scale, including 1) the geographic range of the species in western North America; 2) the physical and geographic range and habitat characteristics within populations and subpopulations, as well as dispersal between subpopulations; 3) the habitat characteristics within a home range, and movements between seasonal ranges; and 4) habitat characteristics within a specific seasonal range and movements to daily use sites.

Given the species' use of habitats at these multiple scales, an adequate cumulative effects analysis for actions that may affect the greater sage-grouse must incorporate a range of scales. This range of scales must be meaningful biologically and must also provide meaningful context relative to the scope of the activity being evaluated (e.g., grazing permit renewals). Selection of too broad an analysis area, such as the entire range of the species or a sage-grouse management zone, would likely dilute any potential cumulative effects of a grazing permit, whereas selection of too small an area such as a portion of a pasture may almost always show effects.

Several authors (Connelly, Knick, Schroeder, & Stiver, 2004) (Stiver, et al., 2006) (Garton, et al., 2011) have delineated sage-grouse populations, sub-populations, and/or management zones across the range of the sage-grouse, and some of these population delineations differ slightly spatially or by name. Connelly et al. (2004) identified the Great Basin Core population, which encompassed a large area overlying northern and southern Nevada, southeastern Oregon, northwestern Utah and southern Idaho, and subdivided these into smaller subpopulations. In a more recent analysis, Garton et al. (2011) delineated a Northern Great Basin population, which is essentially the northern portion of the Great Basin Core population, but he did not delineate subpopulations. The Northern Great Basin population delineation seems to fit more closely with what is currently suspected about likely sage-grouse lek connectivity in the northern Great Basin (Makela & Major, 2012). Therefore, the cumulative effects analysis area for fish and wildlife resources is delineated by the approximately 5.7 million acre Owyhee subpopulation (i.e., north-central Nevada/southeast Oregon/southwest Idaho) (Map CMLV-3) (Connelly, Knick, Schroeder, & Stiver, 2004).

Besides sage-grouse, the Owyhee subpopulation area provides meaningful context and relevance for large and/or highly mobile species (e.g., big game, raptors, and migratory birds), while greatly exceeding the range of many resident fish and wildlife species. This cumulative effects area encompasses all sage-grouse habitat within the Owyhee Field Office boundary, as well as additional adjacent habitat in southeastern Oregon, northern Nevada, and nearly half of the Bruneau Field Office in Idaho. Analysis timeframes include past activities that have created the present conditions and future activities planned within the next 3 years, including the expected duration of effects from current and future activities (generally 10 to 20 years).

Current Conditions

The past, present, and reasonably foreseeable future actions within the cumulative effects analysis area relevant to fish and wildlife resources are presented in Table WDLF-4. The spatial extent of these actions was calculated using the best available BLM GIS data.

Table WDLF-4: Past, present, and foreseeable future actions within the cumulative effects analysis area for fish and wildlife

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing	251 active BLM allotments	Permits will be renewed/modified as they expire
Wildfire	612,753 acres (1985-2012)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	At least 28,378 acres (1952-2011)	9,750 acres
Agriculture	621,207 acres (up to 2011)	None
Roads and Transmission Lines	8,083 miles	None

In much of the analysis area, upland, riparian, and stream habitats have been adversely affected by grazing practices (e.g., season of use, stocking rates) and rangeland management infrastructure (e.g., fences, water developments), wildfire, vegetation treatments (e.g., prescribed fires, shrub and conifer control, seedings), and habitat fragmentation due to buildings, roads, and transmission line. As a result, wildlife habitat and populations in the analysis area has been altered from the conditions before Euroamerican colonization of North America and what would be expected under a natural disturbance regime.

In addition, across their distribution, some wildlife species' populations (i.e., sage-grouse and bighorn sheep) have been impacted by disease (i.e., West Nile virus and pneumonia, respectively). Although these diseases currently do not appear to be an issue with local sage-grouse and bighorn sheep, West Nile virus (WNV) has been documented in sage-grouse in Idaho and in 2006, the sage-grouse hunting season was closed in western Owyhee County due to concerns of WNV impacts (Idaho Sage-grouse Advisory Committee, 2008). Large, intact, low- to mid-elevation populations, like those in the cumulative effects area, may be able to endure impacts of WNV if the quality and extent of available habitat still supports positive population growth (Walker & Naugle, 2011). There appears to be a relatively low risk of contraction of pneumonia by Owyhee River PMU bighorn sheep because the primary vectors of transmission, domestic sheep, do not overlap with the local population (i.e., Owyhee River PMU in Idaho and the Upper Owyhee River Herd in Oregon collectively).

Native ungulates (e.g., deer, elk, pronghorn, and bighorn sheep) are common in the analysis area and long-distance, interstate movements to seasonal ranges have been documented. The surrounding deep canyons of the Owyhee River system provide relatively undisturbed cliff nesting habitat for a variety of wide-ranging raptors (e.g., golden eagle and prairie falcon) and bird species. The abundant juniper woodlands provide an expanding habitat type for forest-associated species (e.g., northern goshawk and special status bats) in an otherwise shrub steppe matrix. Woodland species' populations have benefited from fire suppression activities that have promoted juniper expansion at the expense of shrub-dependent species such as sage-grouse, Brewer's and sage sparrows, loggerhead shrike, and pygmy rabbits. Riparian areas, although many not in properly functioning condition, do support limited populations of spotted frog and redband trout. Although populations of some notable species (e.g., sage-grouse) have declined range-wide, population trends in the analysis area for most fish, wildlife, and special status species are unknown because long-term monitoring data are lacking.

Wildlife, fisheries, and special status species and their habitats in the analysis area have been affected by livestock grazing for more than a century. Allotments in this area are primarily grazed throughout the spring and summer. A variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs, have been built across the landscape to aid in livestock grazing management.

Allotments in the analysis area are in various stages of the 10-year permit cycle, and as expiration dates approach, each allotment will be evaluated for rangeland health and progress toward meeting the Fundamentals of Rangeland Standards prior to the authorization of a new permit. Overall, past and current grazing in the cumulative effects area has had an adverse effect on fish and wildlife habitats because grazing has primarily occurred during the spring and summer months, when native perennial vegetation in the uplands is actively growing and most susceptible to the negative effects of livestock grazing, and soils and vegetation in riparian areas are impacted by continual presence and heavy use of these comparatively moist and cooler environments, respectively. Reasonably foreseeable future grazing management is expected to improve the condition of fish and wildlife habitats at least to make significant progress towards meeting the Idaho Rangeland Health Standards.

Wildfire records maintained by the BLM indicate that approximately 11 percent of the cumulative effects area has burned between 1985 and 2012. Wildfires have primarily removed shrub steppe habitats which negatively impact many special status species including sage-grouse. Although wildfires are a natural and critical component in the restoration of late-seral communities in the cumulative effects area, invasive species such as cheatgrass and medusahead wild rye presently colonize and infest low elevation burned areas first, outcompete and displace native species, and foster a shorter fire-return cycle to the detriment of the establishment and return of native shrub steppe communities and wildlife habitat. Conversely, fire suppression has enabled western juniper to expand into shrub steppe communities and slowly convert encroached areas into woodlands which precludes many of the obligate and dependent wildlife species that occupied the former shrublands and grasslands.

Less than 0.5 percent of the cumulative effects area has been affected by vegetation treatments. Vegetation treatments include prescribed fires, juniper and sagebrush control, and non-native perennial grass seedings. Due to the relatively limited and small size of treatment areas, effects of vegetation treatments within the cumulative effects area have been negligible.

Approximately 11 percent of the cumulative effects area is comprised of agricultural lands, the majority of which are hay fields in support of local grazing operations. Most of this acreage occurs along the region's rivers and streams. Due to these practices, the former riparian habitats in many of these floodplain areas are deteriorated or absent. Although these areas have been substantially altered, they still may provide valuable albeit marginal quality habitat for many wildlife species.

More than 8,000 miles of roads of varying surface types and use levels occur within the cumulative effects area. Although some of these miles comprise major roads and highways, the overwhelming majority are low use, unmaintained two-tracks. Major paved and graveled roads fragment habitat to a far greater extent than unmaintained dirt roads. Although roads present both spatial and temporal barriers to home range, dispersal, and migratory movements of a variety of wildlife species, the low population density of the cumulative effects area and relatively low use levels of most roads limits many of the negative effects and disturbance associated with transportation networks.

3.4.5.3.1 Alternative 1 Effects

Under Alternative 1, grazing management has been shown to reduce cover and forage for wildlife in riparian areas and lead to trampling and breakdown of streambanks. In addition, frequent grazing during the active growing season in the uplands has led to static habitat conditions that have not allowed improvements to perennial bunchgrass vigor and health nor progress toward a full complement of native perennial species consistent with ecological site potential. Continuation of extended hot-season grazing would concentrate livestock use on riparian areas, thus decreasing riparian vegetation that wildlife use for nesting substrate, cover, and foraging habitat. These effects would negligibly contribute to an overall decrease in the quality of fish and wildlife habitat throughout the cumulative effects area. In addition, the number of individuals necessary to support neighboring fish and wildlife populations and maintain the genetic diversity of existing populations across the landscape could decrease. The continued degradation of riparian habitats would negatively affect habitat for many species of migratory birds and sage-grouse, especially those with broods.

When these factors are combined with the past, present, and reasonably foreseeable future actions that have impacted wildlife habitats within the cumulative effects area, the downward trend in habitat conditions within the Castlehead-Lambert allotment would not meet ORMP wildlife, fisheries, and special status species management objectives. Although conditions are not expected to improve or worsen in upland habitats for sage-grouse, significant progress toward meeting the Idaho rangeland health standard for special status animals would not occur, due to the continuation of extended hot-season grazing that degrades habitat in riparian areas. However, due to the relatively small amount of PPH-sagebrush within the allotment in comparison to the size of the cumulative effects area, the threshold for unacceptable change in the majority of fish and wildlife population including the Owyhee sage-grouse subpopulation most likely would not be exceeded.

3.4.5.3.2 Alternative 2 Effects

Livestock grazing under Alternative 2 would reduce forage and cover for wildlife in uplands and riparian areas, lead to trampling and breakdown of stream banks, and reduced numbers and vigor of native plant species from consumption and trampling, increase sediment into streams, and allow invasive plant species to outcompete native species due to reduced vigor in the latter. Habitat conditions for wildlife and fish populations in the allotment would deteriorate because periodic rest of pastures would not occur, some pastures would be grazed annually during the growing season (frequently during the critical growing season), and riparian areas would be grazed during the hot season. These factors lead to the deterioration of wildlife habitats because they decrease the ability of native plant communities to remain healthy, vigorous, and productive, and provide adequate forage and cover for wildlife species.

When these factors are combined with the past, present, and reasonably foreseeable future actions that have impacted wildlife habitats within the cumulative effects area, the downward trend in habitat conditions within the Castlehead-Lambert allotment would not meet ORMP wildlife, fisheries, and special status species management objectives. Because a general deterioration of wildlife habitats is likely in upland and riparian communities, and improvements in sage-grouse habitat conditions are not expected, the Idaho Rangeland Health Standard for special status animals would not be met under Alternative 2. Due to the relatively small amount of PPH-sagebrush within the allotment in comparison to the size of the cumulative effects area, the threshold for unacceptable change in the majority of fish and wildlife population, including the Owyhee sage-grouse subpopulation, most likely would not be exceeded.

3.4.5.3.3 Alternative 3 Effects

Under Alternative 3, substantial improvements to wildlife habitat in upland and riparian areas would be realized over the term of the permit. Implementation of Alternative 3 would include performance-based terms and conditions that were developed to protect and enhance native plant communities in the uplands and riparian areas, and breeding, brood-rearing, and foraging habitats for sage-grouse and other upland and riparian wildlife species. Compliance with the term and condition #14 would provide suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season throughout PPH-sagebrush within the allotment. The expected improvements from proposed grazing management considered cumulatively with other activities should benefit fish and wildlife habitat and populations overall. However, improving fish and wildlife populations within the allotment would negligibly contribute to more robust regional fish and wildlife populations.

Sage-grouse PPH-sagebrush within the allotment is limited and is primarily connected to large areas of sagebrush habitat to the east. Adjacent shrublands are comprised of large areas of contiguous, intact sagebrush habitats in the Nickel Creek allotment and the Bruneau Field Office. Trend information for the Owyhee subpopulation is limited, as leks are surveyed infrequently, primarily due to inaccessibility. Sage-grouse habitat within the allotment most likely represents the periphery of the range of the local population (deme). Any adverse effects occurring in the allotment would probably have minimal consequences to the local Owyhee subpopulation. Trends in sage-grouse populations at the broadest scale in this analysis (i.e., population level) are more readily available. A recent analysis shows that the proportion of active leks and the average number of males per active lek has decreased over the past 40 years within the Northern Great Basin population (Garton, et al., 2011). The minimal effects to the sage-grouse population from grazing management actions occurring in the Castlehead-Lambert allotment and the Owyhee subpopulation would have a negligible effect on the viability of the regional Northern Great Basin population or the species range-wide.

Although improvement to wildlife and sage-grouse habitats at the allotment level are expected under Alternative 3, and direct and indirect effects from grazing management of this project are expected to be relatively small and localized, cumulative effects from this project, along with other past and ongoing activities within the cumulative effects area, are not likely to negatively affect any special status species' viability in a substantial way, nor lead to the need for any listing under the ESA. Recovery of wildlife habitat within the allotment could occur in the short term (depending on the current degradation and ecological resiliency of the site) and would continue through the term of the permit; significant progress toward meeting the Idaho rangeland health standard for special status animals would occur. The threshold for unacceptable change in the majority of fish and wildlife populations, including the Owyhee sage-grouse subpopulation, most likely would not be exceeded due to the negligible size of the allotment in relation to the cumulative effects area.

3.4.5.3.4 Alternative 4 Effects

Grazing management under Alternative 4 would provide substantial benefits to fish and wildlife habitat. Specifically, wildlife habitat in upland and riparian areas would improve throughout the allotment due to a reduction in AUMs, an overall increase in acres/AUM, changes in season of use, and the potential for periodic rest and deferment. Utilization levels are expected to decrease and likely result in greater forage and cover for wildlife, due to a reduction in AUMs which would result in an overall increase in acres/AUM. Changes in season of use in some pastures would result in fewer disturbances to wildlife breeding activities in uplands and riparian areas. Periodic rest and/or deferment in most of the pastures in conjunction with changes in seasons of use in pastures with riparian areas and sage-grouse nesting habitat would favor improvements in vegetation community composition, structure, and overall health.

Cumulative effects to sage-grouse and their habitats within the cumulative effects area would be the same as those described above for Alternative 3. The expected improvements from proposed grazing management, considered cumulatively with other activities, should benefit fish and wildlife habitat and populations overall. Improving fish and wildlife populations within the allotment would contribute, albeit negligibly, to more robust regional fish and wildlife populations. Habitats are expected to recover and improve and significant progress toward meeting the Idaho Rangeland Health Standard for special status animals would occur. The threshold for unacceptable change in the majority of fish and wildlife populations including the Owyhee sage-grouse subpopulation most likely would not be exceeded due to the negligible size of the allotment in relation to the cumulative effects area.

3.4.5.3.5 Alternative 5 Effects

The extended rest under Alternative 5 would depart markedly from the predominant grazing systems in the analysis area, creating a unique, large area undisturbed by livestock grazing, which would provide a refuge for wildlife within the allotment and surrounding areas. Extended rest would dramatically improve conditions for all species of wildlife throughout the Castlehead-Lambert allotment. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. The undisturbed mosaic of habitats could augment fish and wildlife populations in the allotment and could provide a productive source area for surrounding allotments.

Cumulative effects to sage-grouse and their habitats within the cumulative effects area would be the same as those described above for Alternative 3. Wildlife and aquatic objectives would be met and there would be substantial progress toward meeting the Idaho Rangeland Health Standard for special status animals. Improvements to headwaters would benefit aquatic habitats and species in the allotment and downstream. Progress would be realized toward improving fish and wildlife habitat conditions below the threshold of unacceptable change. The expected improvements considered cumulatively with other activities should benefit fish and wildlife habitat and populations overall. Improving fish and wildlife populations within the allotment would negligibly contribute to more robust regional fish and wildlife populations.

3.4.6 Recreation

3.4.6.1 Affected Environment

The majority of the Castlehead-Lambert allotment is located within the Owyhee Extensive Recreation Management Area (ERMA). An ERMA is an area where recreation management is only one of several management objectives, and where a limited commitment of resources is required to provide extensive and unstructured types of recreation activities (USDI BLM, 1999a). The main recreational activities within the allotment are hunting, camping, fishing, sight-seeing, backpacking, horseback riding, and nature study. The highest season of use within the allotment occurs during the big-game hunting periods (fall).

In addition, there are approximately 550 acres in the southwest corner of the allotment that are within the Owyhee River Canyon Special Recreation Management Area (SRMA). An SRMA is an area where special or more intensive types of recreation management are needed and greater investments for recreation management are anticipated due to the intensity of use the area receives (USDI BLM, 1999a).

The East Fork Owyhee River lies adjacent to the southern boundary of the allotment. This river system within the Owyhee River Wilderness was designated as a wild river in the 2009 Omnibus Public Land Management Act. The river system offers a variety of recreational opportunities, including whitewater rafting in the early spring/summer months, fishing, backpacking, and hunting and trapping in the fall.

The off-highway motor vehicle (OHV) designations for the allotment are limited to Existing and Closed. Motorized and mechanized cross-country travel is prohibited within the Owyhee Field Office. OHV regulations apply to permitted uses as well as to general public use. The areas identified as closed to motorized vehicles are within the Owyhee River wilderness and The Badlands Resource Natural Area (RNA) and Area of Critical Environmental Concern (ACEC). The remainder of the area would be categorized as limited to existing roads and trails. The ORPM identifies areas within the allotment as limited to Designated; however, until the area undergoes a travel planning and route designation process, the area would remain as limited to Existing.

The Recreation Opportunity Spectrum (ROS) classification is used to characterize the type of recreational opportunity settings, activities, and experience opportunities that can be expected in different areas of public land. The Castlehead-Lambert allotment contains multiple settings for recreationists, such as primitive, semi-primitive non-motorized, and semi-primitive motorized.

The Primitive classification is an area characterized by an essentially unmodified natural environment. The concentration of users is very low and the evidence of other users is minimal. The area is managed essentially to be free from evidence of man-induced facilities for comfort or convenience. Only facilities essential for resource protection are used. Motorized use within the area is not permitted (USDI BLM, 1999a).

The Semi-primitive Motorized and the Semi-primitive Non-motorized classifications are areas that are characterized by a primarily unmodified natural environment. There is evidence of other users in the area, but management actions encourage limited contacts between users. Semi-primitive Motorized classification permits motorized uses within the area, and Semi-primitive Non-motorized does not (USDI BLM, 1999a).

3.4.6.2 Direct and Indirect Effects

3.4.6.2.1 Alternative 1 Effects

Effects to recreation would be the interaction with livestock during periods of livestock use. During periods of non-livestock use, no impacts would be expected. Areas that were improving under the current grazing system would likely continue to improve and provide enhanced opportunities for recreation. Hunting is the most likely recreation opportunity to be impacted, as grazing within pastures 1 and 6 would slightly overlap with some big-game seasons. These impacts are considered to be negligible.

3.4.6.2.2 Alternative 2 Effects

Effects to recreationists would be greater under this alternative as opposed to Alternative 1, due to the increase in the number of livestock and AUMs. The proposed increase in numbers may result in more frequent human/livestock interactions. Similar to Alternative 1, hunting is the most likely recreational activity to be impacted, as proposed grazing schedules could slightly overlap with some big-game hunting seasons. All of the pastures, with the exception of pasture 4, propose a latest off-date during the month of September that would overlap with various big-game seasons. These impacts are considered negligible, however, and no enhanced opportunities for recreation would occur under this alternative.

3.4.6.2.3 Alternative 3 Effects

The proposed performance-based terms and conditions that are associated with this alternative would create more beneficial conditions for recreationists than Alternative 1. As conditions of the area improve, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area. Human/livestock interactions would still occur under this alternative, as grazing schedules overlap with big game hunting seasons; however, these impacts are considered negligible.

3.4.6.2.4 Alternative 4 Effects

The proposed season-based alternative, in combination with fewer AUMs and reduced livestock numbers, would reduce interactions between livestock and recreationists. With most grazing schedules occurring during the summer months, only pasture 1 would endure a slight impact during the hunting season, as there would be a small overlap (roughly 15 days) with some big-game hunting periods.

As conditions of the area improve due to the season-based use and fewer AUMs and livestock numbers, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area.

3.4.6.2.5 Alternative 5 Effects

This alternative would provide the greatest benefit to recreationists within the allotments. There would be no interaction between livestock and recreationists, and as the overall conditions of the area improved, so would visual quality, thus creating a more enjoyable recreation experience. Improved conditions could also potentially increase wildlife viewing opportunities for the recreating public and possibly result in increased hunting success.

3.4.6.3 Cumulative Effects

Cumulative effects to recreation within the Castlehead-Lambert allotment would primarily be the result of grazing, future vegetation treatment projects (such as broadcast burning in surrounding areas), and current and future actions that stem from the Omnibus Public Lands Management Act (OPLMA) that was passed by congress on March 30, 2009 (P.L. 111-11). The passing of the Act designated roughly 517,000 acres of wilderness and 316 miles of wild and scenic rivers within Owyhee County. In addition, the Act also mandates the BLM to complete a transportation plan for all of Owyhee County. The area of analysis for cumulative effects is the area south of the Backcountry Byway, a.k.a. Mud Flat Road to the Owyhee River system (delineated roughly by the Mud Flat on the north, Deep Creek and the Owyhee River on the east, the Owyhee River system on the south, and the Oregon border on the west). This area is a good representation of the summer/fall recreation activities that occur within the area. Access to this area is provided via Mud Flat Road, and the Owyhee River system serves as a natural boundary to the south; there are a couple of crossings along the river system, but most recreational activity accessed from Mud Flat Road stays north of the river system. The timeframe for current conditions includes activities that have occurred since the passing of the OPLMA, and reasonably foreseeable future activities include those planned within the next 3 years, as well as the expected duration of effects from those activities (generally 10 to 20 years).

3.4.6.3.1 Alternatives 1- 5 Effects

Cumulative effects are defined as the impacts on the environment which result from the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions. Cumulative analysis of the alternatives listed above, when added to past, present, and future actions within the cumulative analysis area that is described above, would have minimal effects to recreation overall. Because the analysis covers a much larger area and there are very few positive or negative effects expected from any of the alternatives listed above, cumulative effects for recreation would be minimal. Opportunities for recreational activities in the cumulative analysis area are abundant and would endure minimal impact from any of the alternatives.

Impacts associated with past, present, and future activities would consist of limited access during future burn treatments identified within the cumulative analysis area. Depending on the timing of these treatment projects, hunters and other recreationists' ability to access these areas could be impacted. Range improvements, such as fences, identified throughout the analysis area would reduce some opportunities for non-motorized cross country travel. Accessibility in the area for hunters and other recreationists who rely heavily on roads and trails for motorized access would be reduced as a result of recent wilderness designations. During periods of livestock use, there would be an increase in potential human/livestock interactions. Much of these impacts are short term and considered negligible.

In the long term, the combined effects of suitable grazing management, designation of wilderness areas, wild and scenic rivers, travel management planning, and juniper treatments within the cumulative analysis area would be beneficial to the overall health and scenic quality of the area, which in turn would result in an improved recreation experience.

3.4.7 Visual Resources

3.4.7.1 Affected Environment

The majority of this allotment is categorized as Class IV, with the southernmost portion of the allotment categorized as Class I within the Owyhee River wilderness area, as well as a small section of Class II on the northern edge of the wilderness. There had previously been some Class II Interim Management Plan (IMP) designations within the wilderness study areas; however, those areas were released from wilderness study in the passage of the Omnibus Public Lands Management Act in 2009 and are now categorized as Class IV as directed by the ORMP.

The Visual Resource Management (VRM) Class I objective is to preserve the existing character of the landscape. This class provides for natural ecological changes, but it does not preclude very limited management activity. The level of change to the characteristic of the landscape should be very low and must not attract attention. Under this classification, construction of new rangeland (livestock, watershed, wild horse, and wildlife) facilities, roads, recreation sites, and vegetation treatment projects is not permitted.

The VRM Class II objective is to retain the existing character of the landscape. The level of change to the characteristic of the landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Except within wilderness areas, very limited construction of new rangeland facilities and vegetation treatment projects is permitted.

The objective for VRM Class IV is to provide for management activities which would require major modifications to the existing character of the landscape. These activities may dominate the view and be the focus of attention. However, every attempt should be made to minimize impacts with careful location and minimal disturbances. Maintenance, construction and reconstruction of rangeland facilities and vegetation treatment projects are permitted (USDI BLM, 1999a).

3.4.7.2 Direct and Indirect Effects

3.4.7.2.1 Alternative 1 Effects

The grazing schedule under Alternative 1 would maintain existing visual conditions of the area. Upland vegetation throughout the allotment would essentially remain static, and the proposed grazing schedule would not contribute toward any failures to meet the Idaho rangeland health standard for native plant communities. Additionally, there are no riparian areas/stream segments identified within Class I VRM as non-functioning due to grazing, which indicates that riparian communities and visual resources are not being degraded within these areas. This is important, due to the fact that the level of change to the characteristic of the landscape should be very low within Class I VRM. Segments classified as non-functioning are located within Class IV VRM. Overall, any impacts to visual resources associated with the proposed grazing system would be negligible and are considered acceptable with the VRM objectives for the area.

3.4.7.2.2 Alternative 2 Effects

With the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment and are expected to meet or exceed vegetation management objectives identified in the ORMP, thus impacting the visual resources in the area. However, because much of the allotment is categorized as Class IV VRM, these impacts would be considered acceptable. Conversely, in the areas (pastures 3 and 4) where VRM classifications are categorized in Classes I and II, these impacts would not be considered acceptable, as the goals of these areas are to retain or preserve the existing character of the landscape, and the levels of change to the characteristic of the landscape should be low.

3.4.7.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial to visual resources throughout the area than Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are being met and conditions of the area are improving, which would be beneficial to visual resources throughout the allotment. Any impacts to visual resources associated with the proposed grazing system would be negligible and are considered acceptable with the VRM objectives for the area.

3.4.7.2.4 Alternative 4 Effects

The effects associated with the proposed grazing schedule under this alternative would be beneficial to visual resources throughout the area. The proposed season based alternative in combination with fewer AUMs and reduced livestock numbers would improve the overall health and visual quality of the allotment. Areas that are currently improving would continue to do so, and areas that have been affected by heavy livestock use would also begin to show improvement.

3.4.7.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest amount of benefits to visual resources across the board. There would be no effects to upland vegetation and riparian areas due to livestock grazing, thus improving the overall health and visual quality throughout the allotment.

3.4.7.3 Cumulative Effects

The cumulative effect area would be the same as that described in Section 3.4.6.3. This area was chosen because it encapsulates neighboring allotments currently undergoing grazing permit renewals, as well as proposed future activities, range improvements, and juniper treatment projects.

3.4.7.3.1 Alternatives 1-5 Effects

Because few effects are expected from any alternatives, cumulative effects would be minimal for visual resources within the cumulative analysis area. Grazing activities throughout the analysis area would contribute in varying magnitudes toward cumulative effects by influencing plant species composition within the uplands as well as riparian areas. While these impacts may be greater or lesser within differing allotments, overall, these impacts would be considered minimal throughout the cumulative analysis area as a whole.

In the short term, some visual impacts would occur during construction of future range improvement projects that are associated with neighboring allotments within the defined cumulative effect area, as new areas of disturbance are created. However, because of the excellent vegetative screening and rugged topography throughout much of the areas where these projects are located, and minimal impact construction techniques, these types of features are substantially unnoticeable except at very close distances.

Future juniper treatment projects identified within the cumulative analysis area would have extensive effects on visual resources. An estimated 50 to 70 percent reduction in seral junipers would have a beneficial long-term effect on visual quality as scenic vistas open up and aspen, perennial grasses, and other vegetation increase as a result of juniper removal. Additionally, retaining 30 to 50 percent of the existing juniper as well as old growth juniper and mahogany stands would remain and assist in maintaining the scenic quality throughout the area.

In the long term, the combined effects of suitable grazing management, designation of wilderness areas, wild and scenic rivers, travel management planning, and juniper treatments within the cumulative analysis area would be beneficial to the overall health and scenic quality of the area.

3.4.8 Areas of Critical Environmental Concern and Research Natural Areas

3.4.8.1 Affected Environment

The applicable ORMP objective for management within Areas of Critical Environmental Concern identifies that BLM will "retain existing and designate new areas of critical environmental concern (ACECs) where relevance and importance criteria are met and where special management is needed to protect the values identified." The Castlehead-Lambert allotment includes portion of two ACECs: The Badlands and Owyhee River Bighorn Sheep Habitat Area.

The Badlands (1,833 acres; Plant communities, Special status plants, Scenic values)

The Badlands ACEC is located within pasture 3 of the Castlehead-Lambert allotment. Approximately 90 percent of the acreage lies within pasture 3, with minimal acreage within pasture 2; the remaining acreage is lies within the Nickel Creek allotment (#0548). The dominant plant communities include western juniper/low sagebrush/Idaho fescue and an uncommon bunchgrass community of California oatgrass (*Danthonia californica*)/Idaho fescue. These communities thrive on the shallow soils of broken volcanic topography. A BLM sensitive species, mountain ball cactus, occurs within the badlands where other vegetation is sparse and soils are thin and rocky. Baley's ivesia (*Ivesia baileyi*), a regional plant commonly found on rhyolite canyon walls, also occurs in The Badlands. A number of special status animals also inhabit the area, such as sage-grouse, several species of bats and Neotropical migrants, and a diversity of other wildlife including mule deer, mountain lions, and a variety of raptors and other nongame birds, mammals, reptiles and amphibian species (USDI BLM, 1999a).

In accordance with the 1999 ORMP (USDI BLM, 1999a), The Badlands ACEC is designated as being:

- Excluded from Rights-of-Way actions for surface and subsurface development;
- Prohibited to water developments (with exception to springs), livestock salting, pasture fencing, juniper/vegetation treatment projects, and wildfire suppression activities; and,
- Other multiple use activities include restrictions associated with developing springs, livestock grazing, exclosure fences, and fire rehabilitation actions.

Owyhee River Bighorn Sheep Habitat Area (141,796 acres; Bighorn sheep)

Designation of the ACEC was to enhance habitat for bighorn sheep, to maintain or improve the habitat to at least a good range condition class, and to protect and maintain the scenic and natural values present in the area. Much of this ACEC is located within the recently designated Owyhee River Wilderness Area. At the time of writing the 1999 ORMP, it was estimated that between 500 and 700 bighorn sheep occupied the areas within the ACEC, and it was anticipated that the populations would expand into adjacent habitats in Nevada. Bighorn sheep already exist in adjacent habitats in Oregon. In addition to bighorn sheep, this ACEC is contains a diversity of other wildlife including various raptors, sage-grouse, migratory birds, predators, and big game.

In accordance with the 1999 ORMP (USDI BLM, 1999a), The Owyhee River Bighorn Sheep Habitat Area ACEC is designated as being:

- Excluded from Rights-of-Way actions for surface and subsurface development;

- Prohibited to developing springs and pipelines, wildlife water sources and reservoirs (on 29,520 acres in the ACEC), pasture and exclosure fencing (on 29,520 acres in the ACEC), and juniper/vegetation treatment projects; and,
- Other multiple use activities including restrictions associated with developing wildlife water sources and reservoirs (on 112,276 acres in the ACEC), livestock salting and grazing, pasture and exclosure fencing (on 112,276 acres in the ACEC), and fire suppression and rehabilitation actions (USDI BLM, 1999a).

3.4.8.2 Direct and Indirect Effects

3.4.8.2.1 Alternative 1-4 Effects

The applicants' proposed actions, as limited in this EA to no project construction, as well as the current situation, performance-based, and season-based alternatives, do not include proposals to construct projects or engage in surface disturbing activities. As a result, none of the activities excluded or prohibited within the Badlands or Owyhee River Bighorn Sheep Habitat Area ACECs would be affected. Activities restricted within the two ACECs, including livestock grazing and salting, would continue to be restricted equally under each of the four alternatives, as directed by the ORMP guidance. Relevant and important values for which the two ACECs were designated would continue to be protected.

3.4.8.2.2 Alternative 5 Effects

The no-grazing alternative would not include activities excluded or prohibited within the Badlands or Owyhee River Bighorn Sheep Habitat Area ACECs. Similarly, the alternative would eliminate the need for compliance inspections related to restrictions to livestock grazing and salting within the portions the Badlands and Owyhee River Bighorn Sheep Habitat Area ACECs that occur in the Castlehead-Lambert allotment. Elimination of the need for compliance inspections related to restrictions to livestock grazing and salting would extend through the ten-year term of livestock exclusion from the Castlehead-Lambert allotment. Relevant and important values for which the two ACECs were designated would continue to be protected.

3.4.8.3 Cumulative Effects

The cumulative effects analysis area for ACECs is defined by the bounds of the Bureau of Land Management Owyhee Field Office. The land use plan for the Owyhee Field Office, the ORMP, designated 12 ACECs totaling 167,372 acres. Restrictions to activities authorized were included in the management direction provided by the plan.

3.4.8.3.1 Alternative 1-5 Effects

Activities excluded, prohibited, or restricted in the 12 ACECs, as identified in the ORMP, would retain relevant and important values unchanged and protected in the cumulative effects analysis area.

3.4.9 Wilderness and Wild and Scenic Rivers

3.4.9.1 Affected Environment

A portion of the Owyhee River Wilderness is included within the boundaries of the Castlehead-Lambert allotment. In 2009, this area was designated as wilderness through the OPLMA. The Owyhee River Wilderness is 267,328 acres in size, and roughly 8,685 acres lie within the southern portion of the allotment.

The wilderness area consists of a flat desert shrub expanse that lies on a moderately eroded tableland. The wilderness is centered on the Owyhee River and its tributaries, in the southwest portion of Idaho near the Oregon border. The land is defined by rivers, cutting steep canyons out of high-desert sagebrush plateaus.

Regulations administering management of wilderness areas specify that they be managed in a manner that preserves and protects wilderness characteristics and values. Wilderness values include solitude, naturalness, opportunities for primitive and unconfined recreation, and the presence of special features that enhance wilderness values. The Owyhee River Wilderness contains naturalness, outstanding opportunities for solitude due to excellent topographic and vegetative screening, outstanding opportunities for primitive and unconfined recreation, and supplemental values such as scenic, scientific, wildlife, and cultural values.

BLM Manual 8560 [Sec .08 (A)(1)] states that, "The Wilderness Act directs that wilderness areas be managed to provide for their protection, the preservation of their natural conditions, and the preservation of their wilderness character." The continuation of existing grazing, in accordance with [Sec 4(d)(4)(2)] of the Wilderness Act provides for continued livestock grazing where established prior to designating the area as wilderness. The objective of livestock management in wilderness is to utilize the forage resource in conformity with established wilderness objectives for each area and BLM grazing regulations (43 CFR 4100), and through practical, reasonable and uniform application of the congressional guidelines and policy (BLM Manual 8560).

Approximately 8 miles of the 67-mile stretch of designated wild Owyhee River flows just south of the Castlehead-Lambert allotment and through the wilderness area. In addition, just outside of the southwestern boundary of the allotment is a 4.6-mile stretch of wild river known as Red Canyon. Both river segments were designated wild rivers in the OPLMA.

Both wild river segments, 8 miles of the Owyhee River and 4.6 miles of Red Canyon, are outside of the allotment, adjacent to the southern and southwestern boundaries. Livestock access to the wild river corridors are restricted by natural barriers and fencing. Both wild rivers contain a multitude of outstandingly remarkable values (ORV), including scenic, recreational, geologic, and wildlife values (USDI BLM, 1999a). ORVs are defined as those characteristics that make the river worthy of special protection.

Regulations administering the management of Wild and Scenic Rivers specify that the corridors be managed in a manner to preserve and protect the values of the river corridor which make it outstandingly remarkable while providing river related recreational opportunities in a primitive setting. Within Wild and Scenic River corridors, agricultural use is restricted to a limited amount of domestic livestock grazing to the extent practiced prior to designation (BLM Manual 8351).

3.4.9.2 Direct and Indirect Effects

3.4.9.2.1 Alternative 1 Effects

Overall, there are no expected impacts to wilderness under this alternative, as only a small portion (8,685 acres) of the roughly 267,000 acre Owyhee River Wilderness lies within the allotment. Impacts to the portion of wilderness that lies within the Castlehead-Lambert allotment would be negligible, as the current grazing schedule would maintain existing conditions of the area. Upland vegetation throughout the allotment would remain in its current state, and there are no riparian areas/stream segments identified within wilderness as non-functioning due to grazing. Therefore, the area's naturalness, wilderness character, and values would be preserved under this alternative which would be in conformance with the Wilderness Act.

There would be no impacts to solitude or primitive and unconfined recreation in this alternative.

Additionally, the 8-mile stretch of Owyhee River, as well as the 4.6-mile stretch of Red Canyon that flow just outside the allotment boundary, would be in conformance with the Wild and Scenic River Act. Livestock are unable to access these river segments due to topography, therefore there would be no impacts from grazing to the outstanding remarkable values associated with the wild river corridors, thus maintaining conformance with the WSR Act.

3.4.9.2.2 Alternative 2 Effects

With the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment under this alternative. It is anticipated that the proposed grazing schedule would result in utilization levels reaching or exceeding the maximum allowable limit of 50 percent established in the ORMP to meet vegetation management objectives. Based on these outlooks, the areas naturalness in uplands as well as riparian areas throughout the allotment would be degraded, thus impacting wilderness characteristics and values. The BLM, recognizing these criteria and understanding that grazing is an allowable grandfathered use within the Owyhee River Wilderness, must manage public lands to meet standards as well as to protect and enhance wilderness characteristics. Therefore this would not be in conformance with the Wilderness Act, which states to preserve and protect these features within wilderness.

There would be no impacts to solitude or primitive and unconfined recreation in this alternative.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.4.9.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial than those identified in Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are being met and conditions are improving throughout the allotment, which in turn would be beneficial to the area’s naturalness, thus enhancing wilderness characteristics and values.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.4.9.2.4 Alternative 4 Effects

Implementation of the proposed grazing system would conform to the Wilderness Act. Overall, the conditions of the area would improve due to the combination of a season-based alternative, fewer AUMs and reduced livestock numbers. This would improve ecological health, naturalness, and visual quality throughout the allotment, thus enhancing wilderness characteristics and values.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.4.9.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest benefit to wilderness characteristics. There would be no effects to upland vegetation and riparian areas due to livestock grazing. The overall health, naturalness, and visual quality throughout the entire allotment would improve, thus enhancing wilderness characteristics and values.

3.4.9.3 Cumulative Effects

Cumulative effects to wilderness within the Castlehead-Lambert allotment would primarily be the result of grazing, and current and future actions that stem from OPLMA. The wilderness area in its entirety was selected as the analysis area due to the fact that activities that occur within wilderness, whether throughout the entire wilderness area or only a portion, influence the character and values as a whole. The timeframe considered is activities since the OPLMA for current conditions and activities planned within the next 3 years, and the expected duration of effects from those activities (generally 10 to 20 years).

3.4.9.3.1 Alternatives 1, 3, 4, 5 Effects

Effects to wilderness and wild and scenic rivers are expected to be minimal under these alternatives. There are no proposed range improvement projects within the wilderness area, thus there would be no impacts associated with these projects. Grazing activities throughout the analysis area would contribute in varying magnitudes toward cumulative effects by influencing plant species composition within the uplands and riparian areas, thus impacting wilderness character to a greater or lesser degree. While these impacts may fluctuate within differing allotments, overall these impacts would be considered insignificant throughout the cumulative analysis area as a whole and would not impair wilderness characteristics. Cumulatively, the impacts to solitude or primitive and unconfined recreation within designated wilderness areas would be negligible.

In the long term, the combined effects from suitable grazing management within the cumulative analysis area, and travel management planning outside the wilderness boundaries would be beneficial to wilderness areas and wild and scenic rivers, as the lands within and surrounding these areas improve overall.

3.4.9.3.2 Alternative 2 Effects

Much like the Alternatives 1, 3, 4, and 5, the effects from past actions such as the recent designation of the wilderness, and future actions such as travel management planning, which will occur outside the wilderness boundaries would be beneficial to wilderness areas and wild and scenic rivers, as the lands within and surrounding the cumulative analysis area improve overall as resources are further protected.

Cumulatively however, these benefits, when combined with the Alternative 2 grazing schedule, could conceivably be contradicted. Under the Alternative 2 grazing schedule, upland vegetation communities and riparian areas would not be expected to improve. It is anticipated that the grazing schedule under this alternative would exacerbate these effects, and the area's naturalness in uplands and riparian areas would be negatively affected, thus impacting wilderness characteristics and values.

These impacts to the cumulative analysis area may only affect a small portion of the wilderness, and may not impair the wilderness designation as a whole, however, the impacts would not be in conformance with the Wilderness Act, which states to protect or enhance wilderness character throughout the entire wilderness.

3.4.10 Lands with Wilderness Characteristics (Outside of Designated Wilderness)

3.4.10.1 Affected Environment

Lands with Wilderness Characteristics (LWCs) are lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in Section 2(c) of the Wilderness Act. In order for an area to be classified as an LWC, it must possess sufficient size (more than 5,000 acres), naturalness, and outstanding opportunities for either solitude and/or primitive and unconfined recreation.

In addition, it may also possess supplemental values, such as ecological, geological, or other features of scientific, educational, scenic, or historical value.

As directed by Section 201 of FLPMA, BLM began an inventory of public lands identifying LWCs in the 1970s. The OFO has approximately 100 separate units that were each assessed for wilderness characteristics through a public process. An update of the 1970s inventory, which is required by FLPMA, is currently ongoing. Units within the four allotments being evaluated have recently been updated and those findings are reflected in this document. The Castlehead-Lambert allotment consists of a portion of one unit that contains LWCs. This unit is identified as 106-47 – West Fork Red Canyon.

A portion of Unit 106-47 was part of a Wilderness Study Area (WSA) known as West Fork Red Canyon. In 2009, Congress passed the OPLMA, designating more than 500,000 acres of wilderness in Owyhee County. The OPLMA also released several WSAs, one of which was West Fork Red Canyon, and opened these lands up to other uses, as per the recommendation of the 1991 Idaho Wilderness Study Report (USDI BLM, 1991).

Unit 106-47 within the Castlehead-Lambert allotment was identified as having LWCs and is listed and described below:

Unit 106-47 – West Fork Red Canyon
This unit contains 31,590 acres, 98 percent of which is BLM-administered. The unit is located on the relatively steep southern slope of Juniper Mountain. The topography is broken up; major drainages include the East and West Forks of Red Canyon, as well as Bear, Pete's, and Cow Creek. Bull Basin occupies the south-central portion.

The unit is bisected by a route and a fence line that runs north and south across the entire unit, thus dividing it into an eastern and western portion. The western portion of the unit is a very rugged mountainous region with V-shaped canyons, while the eastern portion is a moderately eroded high plateau. A dense cover of juniper with scattered openings dominates the vegetation in the unit, with the exception of the extreme southern portion, where shrub species are dominant. There are more than 15,000 acres within the western portion that appear to be affected primarily by the forces of nature. The western portion of this unit became part of the West Fork Red Canyon Wilderness Study Area and was later released in 2009.

The eastern portion contains four substantial fence lines and four routes that penetrate into the core of the unit. The western portion contains two routes and a short fence line that intrudes the unit in the SW periphery. There are two small exclosures and a State Land inholding in the NE periphery of the western portion. Intrusions are few, not substantial, and peripheral. Users traveling within the core of the western portion of the unit are very unlikely to encounter substantially noticeable human imprints.

The more than 15,000 acres in the western portion of the unit contains vegetative screening that is excellent as a whole, with the exception of the extreme southern portion, where high desert shrubs dominate. Dense stands of juniper dominate most of the unit. The broken, well-dissected terrain provides excellent topographic screening. The western portions adequate size, good configuration and generally excellent topographic and vegetative screening provide outstanding opportunities for solitude.

Primitive opportunities within the unit include backpacking, photography, sightseeing, horseback riding, hunting, fishing, and wildlife observation. Mule deer hunting may be considered outstanding; the combination of good habitat and broken, challenging country provides excellent hunting and other recreational opportunities.

The diversity of recreational attractions and the opportunity for hunting and other types of recreation render the opportunities for primitive and unconfined recreation outstanding.

3.4.10.2 Direct and Indirect Effects

3.4.10.2.1 Alternative 1 Effects

The effects to LWCs from the continued grazing schedule would be impacts to naturalness within some riparian areas. Multiple stream segments and springs within the lands identified as having wilderness characteristic, have been inventoried and classified as functioning-at-risk (streams) or non-functioning (springs). Continuation of the current management strategy could impact (cause to become worse or better), but not impair (preclude units from being identified as having LWCs), the naturalness of LWCs identified in Unit 106-47 if conditions are not maintained or improved.

Upland vegetation throughout the allotment would essentially remain in its existing condition and therefore there would be no impact to those vegetative communities or the areas naturalness. Additionally, there would be no impacts to solitude or primitive and unconfined recreation in this alternative.

Overall, this alternative would encounter some impacts due to livestock grazing within select riparian areas if conditions aren't maintained or improved; however, the impacts would not impair the LWCs or their values.

3.4.10.2.2 Alternative 2 Effects

With the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment under this alternative. It is anticipated that the proposed grazing schedule would result in utilization levels reaching or exceeding the maximum allowable limit of 50 percent established in the ORMP to meet vegetation management objectives. Based on these outlooks, the area's naturalness in uplands and riparian areas would be affected, thus impacting the characteristics and values identified within unit 106-47.

There would be no impacts to solitude or primitive and unconfined recreation under this alternative.

3.4.10.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial than those identified in Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are met and conditions are improved throughout the allotment, which in turn would be beneficial to the area's naturalness and values.

3.4.10.2.4 Alternative 4 Effects

LWCs are likely to improve with the proposed grazing system under this alternative. Overall, the conditions of the area would improve due to the combination of a season-based alternative, fewer AUMs, and reduced livestock numbers. This would improve ecological health, visual quality, and naturalness throughout the area.

3.4.10.2.5 Alternative 5 Effects

The proposed alternative would provide the greatest amount of benefits to LWCs. There would be no effects to upland vegetation and riparian areas due to livestock grazing, thus improving the overall health, naturalness, and scenic quality throughout the area.

3.4.10.3 Cumulative Effects

Cumulative effects to LWCs within the Castlehead-Lambert allotment would primarily be the result of grazing, vegetative treatment projects, and current and future actions that stem from the OPLMA. The area of analysis for cumulative effects would consist of the inventoried units for the Castlehead-Lambert allotment. The boundaries not only make up the entire allotment but extend into neighboring allotments such as Bull Basin, Trout Springs, Swisher Springs, and Nickel Creek. The timeframe for current conditions includes activities that have occurred since the passing of the OPLMA, and reasonably foreseeable future activities include those planned within the next 3 years, as well as the expected duration of effects from those activities (generally 10 to 20 years).

3.4.10.3.1 Alternatives 1, 3, 4, 5 Effects

Because there are no substantial effects expected from any of these alternatives, cumulative effects would be minimal for LWCs. The short-term impacts from juniper treatments (or no juniper treatments) within the defined cumulative effects area are not expected to be significant or impairing on LWCs. Juniper treatments would have varying degrees of impacts to solitude as vegetative screening is reduced. However these impacts are considered to be minimal, as an estimated 30 to 50 percent of seral juniper would remain. With 30 to 50 percent of juniper remaining, in addition to the rugged topography of much of these areas, opportunities for solitude would still be considered outstanding.

Grazing activities throughout the analysis area would contribute in varying magnitudes toward cumulative effects by influencing plant species composition within the uplands as well as riparian areas, thus impacting the areas visual resources and naturalness to a greater or lesser degree. While these impacts may fluctuate within differing allotments, overall, considering the cumulative analysis area as a whole, these impacts are considered minimal and would not impair LWCs.

In the long term, the combined effects of suitable grazing management, travel management planning, and vegetative treatments within the cumulative analysis area would be beneficial to LWCs and the overall ecological health, naturalness, and scenic quality of the area. There would be no long-term impairment of LWCs.

3.4.10.3.2 Alternative 2 Effects

Much like the alternatives 1, 3, 4, and 5, the effects from past actions such as the recent designation of the wilderness, vegetation treatment projects, and future actions such as travel management planning would be beneficial to LWCs, as the lands within and surrounding the cumulative analysis area improve overall as resources are further protected.

Cumulatively however, these benefits, when combined with the Alternative 2 grazing schedule, could conceivably be contradicted. Under the Alternative 2 grazing schedule, upland vegetation communities and riparian areas would not be expected to improve. It is anticipated that the grazing schedule under this alternative would exacerbate these effects, and the area’s naturalness in uplands and riparian areas would be negatively affected, thus impacting characteristics and values.

3.4.11 Economic and Social Values

3.4.11.1 Affected Environment

The Castlehead-Lambert allotment includes 45,826 acres of public land, 217 acres of state land, and three acres of private land in six pastures (Table ALLOT-1) (Map RNGE-1). The allotment is located in Owyhee County, Idaho, approximately 60 miles southwest of Murphy, Idaho and 45 miles southeast of Jordan Valley, Oregon. The allotment includes Lambert Table and is bordered by Juniper Mountain on the north, Owyhee River on the south, and Red Canyon on the west. (Map GEN-1)

Table ALLOT-1: Acreages by pasture and ownership within the Castlehead-Lambert allotment

Allotment	Pasture #	Pasture Name	Public	State	Private	Total [1]
Castlehead-Lambert	1	Castlehead	4,660	3	3	4,665
	2	Carter Springs	9,192	1	0	9,193
	3	Red Basin	11,328	0	0	11,328
	4	Lambert Table	11,544	213	0	11,757
	5	Horse Pasture	1,850	0	0	1,850
	6	Between-the-Canyons	7,252	0	0	7,252
Totals			45,826	217	3	46,046

[1] Total acres may not match the sum of individual ownership acres due to rounding numbers.

The ORMP, the land use plan for lands overseen by the Owyhee Field Office, categorized the Castlehead-Lambert allotment as an improved (I) category allotment with a high priority for management. Categorization of allotments in that land use plan prioritized development and implementation of grazing systems to meet multiple use resource objectives and rangeland health standards based on resource conditions, potentials, and concerns, as well as economics, present management, and other criteria.

In addition to allocating livestock grazing within the Castlehead-Lambert allotment, the ORMP identified issues associated with livestock grazing with a listing of resource concerns and applicable ORMP resource objectives. Resource concerns identified included the ecological condition of vegetation communities, juniper encroachment, noxious weeds, perennial surface water, riparian-wetland ecosystems, crucial big game winter habitat (mule deer), and special status species (bighorn sheep, plants, redband trout, and sage-grouse). ORMP management objectives applicable to this analysis include VEGE-1, WATR-1, RIPN-1, WDLF-1, and SPSS-1[50].

Two grazing permits authorize livestock grazing use of Castlehead-Lambert allotment. The current total permitted use for livestock grazing in the Castlehead-Lambert allotment is 5,324 animal unit months (AUMs)[51], of which 3,244 AUMs are active and 2,080 AUMs are suspended (Table ALLOT-2).

Table ALLOT-2: Permitted use for individual permittees in the Castlehead-Lambert allotment

Permittee	Active Use	Suspension	Permitted Use
06 Livestock	1,915	1,272	3,187
Teo and Sarah Maestrejuan	1,329	808	2,137

[50] See section 1.7 of this EA for ORMP resource objectives or the ORMP (USDI BLM, 1999a)
[51] One animal unit month (AUM) is the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Pastures currently managed as portions of the Castlehead-Lambert allotment were originally part of the Trout Spring allotment (0539) in the Owyhee Rangeland Management Program Summary Report (USDI BLM, 1981). That grazing management decision set a grazing period for the Trout Spring allotment of April 16 to September 30 annually, with a 2-year deferred rotation grazing schedule. Following that grazing management decision, the Castlehead (pastures 1 and 6[52]), Carter Springs (pasture 2), Red Basin (pasture 3), Lambert Table (pasture 4), and Horse (pasture 5) pastures were divided from the Trout Spring allotment to create the Castlehead-Lambert allotment. In 1982, a grazing system was established for the Castlehead-Lambert allotment that included a three-pasture rest/rotation schedule for pastures 2, 3, and 4 (Table-3). Grazing was deferred until after the active growing season every year in pasture 1(includes pasture 6). An approximate date for the end of the active growing season for this allotment was identified in the 1982 grazing system as late June or early July. This system has generally been followed since 1982, with modifications implemented to allow opportunity for recovery following wildfires (Appendix B: Actual Use/Utilization). Pasture 5 is adjacent to pasture 3 and is generally grazed in conjunction with pasture 3. In addition, pasture 5 has been used by domestic horses in accordance with terms and conditions of the permits.

Table ALLOT-3: Castlehead-Lambert allotment grazing schedule implemented in 1982

Pasture	Pasture Name	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1	Castlehead	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30
2	Carter Springs	5/21 to 7/7	Rest	5/21 to 7/7	4/16 to 5/20	5/21 to 7/7	Rest
3	Red Basin	4/16 to 5/20	5/21 to 7/7	Rest	5/21 to 7/7	Rest	5/21 to 7/7
4	Lambert Table	Rest	4/16 to 5/20	4/16 to 5/20	Rest	4/16 to 5/20	4/16 to 5/20

Recorded utilization data are limited from 1998 through 2009. Data that were recorded from 2010 and 2011 identify that recent utilization levels have been less than the maximum allowable level of 50 percent set in livestock grazing management actions of the ORMP (Appendix B).

3.4.11.2 Direct and Indirect Effects

Table SOCE-12 below shows the change in AUMs for each alternative on the Castlehead-Lambert allotment and the value of those changes. These values assume that the animals use all of the active use AUMs authorized. In the table, the net annual effect—which is equal to the dollar value of the change in total AUMs plus or minus the resulting difference in grazing fees—represents the market value of the change in AUMs for hypothetical livestock operations. It should not be construed as an estimate of the actual economic impact on actual individual ranches within the study area. Ranchers have a wide range of options available to them in terms of how they respond to changes in the permitted number of AUMs on their range allotment(s). Depending on the length of their allowed grazing season and the specific change in permitted AUMs, a rancher might choose to increase or decrease herd size, change grazing months, retain or sell animals at their headquarters, lease new ground or cancel one or more leases on private rangeland, switch to irrigated pasture, adjust feed lot contracts, completely change operation types, and so on. Given the number of uncertain variables and the range of possibilities, it is not feasible to anticipate how individual ranches will react to changes in their specific grazing permits. Also unknown are any and all associated business decisions made in response to prevailing markets, federal and state agricultural policies, and personal values.

[52] Castlehead pasture was identified as pasture 1 through 2005 when a division fence was constructed to divide the pasture, creating a new Castlehead pasture (now pasture 1) and Between-the-Canyons pasture (now pasture 6).

BLM acknowledges that as a result of any changes in permitted AUMs, there are likely to be multiplier effects within the economy that serves the associated ranching community. Because it is not possible to quantify the specific monetary impacts on individual ranches, it is also not possible to accurately estimate the resulting multiplier effects. It is possible, however, to state qualitatively, for example, that a reduction in AUMs would result in a corresponding reduction in regional economic activity if ranches choose to reduce herd numbers and then in turn reduce their spending within the regional economy. The converse is also true (see this related discussion in Section 3.3.1.6 above).

Table SOCE-12: Value of change in AUMs for each alternative, based on 10-year market value*

Alternative	% Change in AUMs	Change in Total AUMs	Total AUMs in Alternative	Annual Dollar Value of Change	Net Annual Effect (Dollar Value of Change +/- Difference in Grazing Fees)
1 (Current Situation)	0%	0	3,020	$0	$0
2	42%	1258	4,278	$15,939	$14,241
3	7%	224	3,244	$2,838	$2,536
4	-30%	-919	2,101	-$11,644	-$10,403
5 (No Grazing)	-100%	-3020	0	-$38,263	-$34,186

*Ten-year Average Market Value of Forage per AUM in Idaho, 2002 - 2011 (non-irrigated private ground): $12.67

3.4.11.2.1 Alternative 1 Effects

Implementation of Alternative 1 would retain authorized levels of grazing use at the maximum level used by permittees in recent years, although reduce authorized levels by 9 percent from active use identified in current permits. Active use on existing permits would be reduced by a total of 299 AUMs. A total of 3,020 AUMs would be active and support grazing for 519 head of cattle from May 15 through September 30 annually, retaining support of ranch income at current levels. The allotment would also provide forage for 10 head of horses from April 8 through September 30 for one permittee. Grazing use would be authorized in the six pastures of the allotment between 11.2 and 19.3 acres per AUM, utilizing upland forage resources between pastures relatively equally. This equitable division of use among pastures would retain a moderate level of grazing use within the allotment. Livestock moves between pastures would continue with no moves requiring trailing through an unscheduled pasture. The grazing schedule would capitalize on opportunity to graze pasture 4, a pasture with limited livestock water that is primarily provided from small reservoirs and becomes less available as the grazing season progresses, as a result of scheduled use at turnout in years when not rested. Similarly, the schedule would support ease of moving livestock off the allotment at the end of the grazing season by maintaining the combined pastures 1 and 6 as the last scheduled for use in all years. Flexibility in the grazing schedule, as indicated in recently reported actual use (Appendix B), would continue to provide for within-year adjustments in response to climatic conditions, livestock management needs, and natural events like wildfire.

Costs incurred by the ranchers, such as those for alternative forage or feed, would likely be minimal because the AUMs proposed under Alternative 1 represent the maximum reported use since 2009, so the operators have managed livestock at these levels and paid the same amount for active use AUMs at some time in the recent past, so the change in permitted AUMs would likely have little or no socioeconomic impact on their operations. In addition, grazing schedules would remain the same and thus have no socioeconomic impact on the operation. The ranches would continue contributing to employment and the purchase and sale of goods and services in the counties where they are located. Under Alternative 1, the active use AUMs authorized would translate to an estimated $202,000 to the Owyhee County economy based on estimates from Darden et al (see Section 3.3.1.6 above).

3.4.11.2.2 Alternative 2 Effects

Implementation of the applicants' proposed action would increase levels of grazing use by 42 percent when compared to Alternative 1. 06 Livestock Co. would gain 797 active use AUMs from suspension and the Maestrejuans would gain 536 active use AUMs from suspension. In addition, 06 Livestock Co. would be permitted to graze 144 more cattle on the allotment than under Alternative 1, and the Maestrejuans would be permitted to graze 97 more cattle on the allotment. A total of 4,278 AUMs would be active and support grazing for 760 head of cattle from May 15 through September 30 annually, increasing opportunity for higher livestock sales and ranch income when compared to Alternative 1. The allotment would also provide forage for 10 horses from April 8 through September 22 for one permittee. The revisions to the grazing schedule, with flexibility incorporated, would result in more equitable use of all pastures with between 9.4 and 11.7 acres per AUM scheduled within pastures. Opportunity to adjust move dates between pastures by 5 to 10 days would allow annual adjustments to the grazing schedule in response to climatic conditions, and livestock management needs. The schedule of moves between pastures would not require trailing through pastures not scheduled for use, similar to Alternative 1.

Costs to the ranchers include those for additional AUMs, as well as possible increases in labor costs and feed and care of any additional animals purchased. If the ranchers purchase more animals, they would incur the cost of purchase, as well as the costs of transport to and from the base ranch and feed while on the base ranch. Additional labor could be needed to manage the additional animals. However, the operators could make up for these costs through the increased revenue they would receive when they sell the cattle or horses. Additional ranch hands hired to manage the animals and additional supplies purchased for the animals' upkeep would contribute more income to the local community as well. Under Alternative 2, the active use AUMs authorized would translate to an estimated $286,000 added to the Owyhee County economy, based on estimates from Darden et al (see Section 3.3.1.6 above).

3.4.11.2.3 Alternative 3 Effects

As long as performance criteria are met through each consecutive 5-year period of the 10-year term of the grazing permits, implementation of the performance-based alternative would increase authorized levels of grazing use by 7 percent as compared to the levels authorized in Alternative 1. 06 Livestock Co. would be permitted 167 AUMs more than Alternative 1 and the Maestrejuans would be permitted 132 AUMs more than Alternative 1. 06 Livestock Co. would be permitted to graze 30 more cattle than under Alternative 1 and the Maestrejuans, would be permitted to graze 23 more cattle than under Alternative 1. A total of 3,244 AUMs would be active and support grazing for 572 head of cattle from May 15 through September 30 annually, retaining opportunity to support ranch income at current levels and greater than activated by permittees in recent years. The allotment would also provide forage for 10 head of horses from April 8 through September 30 for one permittee. The grazing rotation between pastures of the Castlehead-Lambert allotment would be unchanged from the current rotation and the same as the rotation discussed in Alternative 1.

As noted in the Effects Common to All Allotments section, the operators are given specific requirements for stubble height and vegetation utilization, and they will have flexibility in adjusting livestock numbers, as long as they stay within these sideboards. Due to this flexibility, it is not possible to provide an accurate analysis of the specific socioeconomic effects from Alternative 3. If either or both of the ranches decide to purchase additional animals, they would incur the cost of purchase, transportation, and upkeep, and may need to hire additional help to manage the animals. Under Alternative 3, the active use AUMs authorized would translate to an estimated $217,000 added to the Owyhee County economy, based on estimates from Darden et al (see Section 3.3.1.6 above).

However, as noted in the Effects Common to All Allotments section above, either or both of the operators might find that it is not possible to graze the entire herd on the federal allotment for the entire length of the grazing season and still remain within the terms and conditions of the permit. In this case, the amount of forage available to permittees would be less than under Alternative 1 and, as a result, the economic contribution of grazing on this allotment would decline compared to Alternative 1. In order to maintain operations at the same level, operator(s) would need to identify alternative forage or feed. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above. If operators do not identify another source of forage or feed, operation levels might need to be reduced. With or without an alternative source of forage or feed, the overall economic contribution of the ranching operations to the regional economy may decline.

3.4.11.2.4 Alternative 4 Effects

Implementation of the season-based alternative would decrease levels of grazing use by 29 percent when compared to Alternative 1. Active use would be reduced by 503 AUMs for 06 Livestock Co. and 341 AUMs for the Maestrejuans. The number of permitted animals on the allotment has been reduced by 90 cattle for 06 Livestock Co. and 61 cattle for the Maestrejuans. A total of 2,101 AUMs would be active and support grazing for 368 head of cattle from May 15 through September 30 annually, reducing opportunity for livestock sales and ranch income when compared to Alternative 1. The allotment would also provide forage for 10 head of horses from April 8 through September 22 for one permittee. Grazing use would be authorized in five pastures of the allotment and through the 2-year schedule between 10.0 and 47.4 acres per AUM, utilizing upland forage resources between pastures unequally. This unequal division of use between pastures, resulting from limitations to seasons when pastures are available for use and when more than one pasture would be available for use in a given shortened season, would leave a portion of upland forage resources in a number of pastures unavailable for livestock use.

Under Alternative 4, the active use AUMs authorized would translate to an estimated $141,000 added to the Owyhee County economy, based on estimates from Darden et al (see Section 3.3.1.6 above). However, the cuts in AUMs and permitted animals for both of these operators would require them to move the animals to other grazing lands or back to the ranch and feed them hay or grain. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above. Ranchers might decide that these management changes would not be economically viable for the continuance of the operation in the long-run. In this case, the socioeconomic impacts of this alternative could be the same as the impacts of not renewing the permit at all, which are outlined in the Alternative 5 analysis below.

3.4.11.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would eliminate public land grazing within the Castlehead-Lambert allotment for 10 years, resulting in a disruption in current livestock management for the two permittees utilizing forage production from the allotment in their annual plans. No permit would be offered with implementation of the no-grazing alternative and existing suspension AUMs would also not be carried forward. Because the two operations use public land forage to support cattle herds for approximately 6 ½ months of their year-round plans, limiting the operations to base property only or permittees' needs to supplement forage production from alternate forage sources would result in significant reductions in herd size or additional planning and administration cost.

The decision not to renew the grazing permit for a period of 10 years could be detrimental to ranching operations associated with this allotment because they would probably not be able to graze their livestock elsewhere for the same cost in grazing fees that they currently pay, and on-ranch feed costs would be substantial. The operators might opt to sell their livestock, equipment, and possibly their buildings and land. The socioeconomic impacts from closing these ranches are described in the Effects Common to All Allotments section above; the removal of the 3,020 AUMs that are authorized in Alternative 1 would be associated with more than $202,000 that these two ranches would no longer contribute to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above).

3.4.11.3 Cumulative Effects

The scope of this analysis covers Owyhee County, ID, Malheur County, OR, and Elko County, NV, because although the Owyhee Field Office has jurisdiction only over the allotments within the Owyhee Resource Area, the ranchers applying for livestock grazing permit renewals maintain base ranches near Jordan Valley, Oregon, and Tuscarora, Nevada. Actions taken regarding grazing permit renewals will affect the socioeconomic conditions in these counties because they influence decisions the operators make regarding their ranches. There are 135,116 active use AUMs permitted in Owyhee County (USDI BLM, 1999a), 407,473 active use AUMs permitted in the Malheur and Jordan Resource Areas in Oregon (USDI BLM, 2002a), and 305,247 AUMs in Elko County (USDI BLM, 1987). Based on estimates from Darden et al (see Section 3.3.1.6 above), which are for Owyhee County, Idaho, but are applied here to the entire three-county area, the total active use AUMs here contribute more than $56.7 million to the local economy.

For Alternatives 1-4, as long as the ranches remain in business, they will continue contributing to employment and the purchase and sale of goods and services in the local areas, and community cohesion will be maintained. For Alternative 5, not renewing the permits would mean that the BLM would no longer be contributing to the ranching community by providing grazing land, and if the ranches chose to close, the operators would no longer be contributing to employment or the purchase and sales of goods and services in the community but. The U.S. government would continue contributing to the county through payments in lieu of taxes (PILT), which totaled more than $9.5 million in Owyhee County from 2003 to 2012, for an average of about $956,000 per year[53]. Ranching plays a large role in all three counties, so although the loss of 06 Livestock Co. and the Maestrejuans' ranch could have a substantial impact on the local communities, the loss, which is small in proportion to the total livestock operations' contributions to the three-county area, likely would not have a cumulative effect on a larger scale.

3.4.12 Cultural/Paleontological Resources

3.4.12.1 Affected Environment

To analyze the Castlehead-Lambert allotment for cultural resource values, a Class I records search was conducted using Geographical Information System (GIS) datasets to verify recorded sites and survey acreage within the allotment. Each site record was reviewed for any comments relating to impacts and other information that would be helpful in this analysis. All inventory reports were examined to confirm the survey location and its adherence to current standards. GIS data and high resolution aerial imagery were also checked for range improvements to identify areas where livestock may congregate and have the greatest potential to create disturbances. This review process is in accordance with the grazing permit/lease renewal guidelines agreement between the BLM and the State Historic Preservation Office (SHPO), dated January 29, 1999, and with standard professional procedures for livestock grazing permit/lease renewals. If impacts to National Register of Historical Places (NRHP)-eligible properties are identified, the stipulations of the grazing permit can be modified to address the presence and protection of these resources.

To date, there have been 11 cultural resources surveys conducted in the Castlehead-Lambert allotment, totaling 1,005 acres, or 2 percent of its BLM-administered land. There are 28 recorded sites in the allotment as an outcome of the inventories and by other means of discovery, like informant input, that date back to 1972. The current site density is one site per 1,636 acres, or 2.6 square miles for the public

[53] Based on BLM data retrieved at http://www.doi.gov/pilt/county-payments.cfm?term=county&state_code=ID&fiscal_yr=2012

land within the allotment. Fourteen site reports mention livestock trampling or grazing as an impact, but none describe the nature or level of disturbance to the site and, until 2012, no monitoring is known to have occurred on any of these sites since their initial recording. Of the 45 range improvement projects on record in the allotment, 32 are potential areas of livestock congregation and four cultural sites may be within 100 meters of these areas, depending on the site's actual size. A 50-meter radius around a potential area of disturbance is considered sufficient to analyze impacts caused by congregation. All four sites are prehistoric locations (three of undetermined NRHP eligibility, one eligible). Using high-resolution aerial imagery, two site locations show signs of impacts, while the other two exhibit no discernible disturbances. One of the site records for these two affected areas contains no useful descriptive information and the site's size is an approximation. A monitoring visit to the site in May 2012 reveals that the recording is in error; the lithic material at the location is a natural phenomenon and is not the result of human transport and/or modification. A re-visit to the other site in June 2012 discovered the presence of livestock but only minor trampling and no compaction or other significant disturbances to the site. Of the remaining recorded sites in the allotment, NHRP statuses for 21 locations are undetermined and three are not eligible. None of the sites in the allotment are listed on the NHRP.

Affected Environment – Paleontology

The majority of the Castlehead-Lambert allotment resides on the Glenns Ferry Formation, the most common geologic formation in southwestern Idaho. Fossils associated with these strata include camels, mastodons, ground sloths, lion-sized cats and primitive dogs. The Lambert Table area is on the Sucker Creek Formation, which may contain fossil evidence of rodents, sheep-like oreodonts and the giant land tortoise. There are no recorded paleontological sites in the allotment.

3.4.12.2 Direct and Indirect Effects

3.4.12.2.1 Alternative 1 Effects

Alternative 1 would renew the grazing permit under the terms and conditions of the expiring permit, with grazing levels equivalent to the maximum actual use reported since 2009. Stocking levels and seasons of use would remain the same and no range improvements or other projects are proposed. This alternative serves as the baseline for comparisons to the other alternatives.

Overall, minor effects to sites from hoof mechanics can be expected to continue from diffused grazing patterns, but no new or increased impacts or disturbances to cultural properties are predicted under this scenario. The allotment is used predominantly in the spring, when water-saturated soils are a concern. Wet soils can increase compaction and displacement of artifacts, facilitate transportation of cultural material away from the site area, and disturb or destroy more fragile elements buried at a deeper depth. These impacts would be exacerbated in areas where livestock gather. Existing data revealed that two sites may be at risk of impacts due to livestock congregation. A monitoring visit in May 2012 discovered that one of these sites had been recorded in error and the location is not a cultural site but rather a naturally occurring phenomenon. The remaining site, monitored in June 2012, evidenced little to no effects from grazing. Cattle were present at the time of the visit; the ground was dry and displayed no signs of soil compaction or subsurface disturbances due to hoof mechanics.

3.4.12.2.2 Alternative 2 Effects

Under this alternative, active use AUMs are proposed to increase by 42 percent. The sizable increase in the numbers of livestock can exacerbate the risk of impacts faced by cultural sites, particularly when sites are in or near areas of animal congregation. Although to a much lesser extent, even those sites removed from gathering areas could experience an elevated level of ground disturbance. With this alternative, sites at or in close proximity to livestock congregation areas would need to be monitoritored for any increase in impacts. In general, where livestock are dispersed, impacts and the effects of grazing tend to be minor.

3.4.12.2.3 Alternative 3 Effects

While the performance-based terms and conditions 12 through 14 for this alternative are of greatest concern for most resources, the increase in active AUMs is the more important component for cultural resources. Although the increase in livestock numbers is minimal, the impacts to sites could grow proportionately in those areas where livestock gather. If the permittees find that they cannot maintain livestock levels or grazing schedules and still meet the rangeland health benchmarks, they might decide to reduce AUMs, change the season of use, and/or alter the length of time spent on the allotment, all of which have the potential to mitigate negative effects to cultural resources. The proposed season of use is identical to Alternative 1 and the impacts would be the same. Monitoring of site locations at or near congregation areas would need to be done to mitigate any impacts.

3.4.12.2.4 Alternative 4 Effects

A reduction of 30 percent in active use AUMs can lessen the possible grazing impacts to cultural resources. Distribution of animals would be greater and grazing would occur primarily in the summer months when soils are drier and less fragile. Sites near areas of animal concentration would face a higher risk of disturbances, but the intensity may be reduced. Monitoring of sites would gauge any positive or negative effects of this alternative, if chosen.

3.4.12.2.5 Alternative 5 Effects

With the absence of livestock, sites would not be affected by the impacts associated with grazing. Cultural resources would still be subject to weather, wildlife, fire, and other natural processes, but these types of impacts have been occurring since the sites were first formed and are generally minor in their overall effects. Artifact collecting and other human-caused disturbances would continue, but if ground cover increased from the lack of foraging and trampling, cultural material could be better hidden and protected.

3.4.12.3 Cumulative Effects

The scope of analysis for the Castlehead-Lambert allotment is considered to be the allotment boundaries. The range of known site characteristics is similar to those in the surrounding areas, and the allotment is not part of an historic district under which sites could have a contributing element potential. There are no recorded or known Traditional Cultural Properties within the allotment. All sites that are considered eligible for the NRHP or are of an undetermined status are managed for preservation and protection. NHPA Section 106 compliance inventories would be conducted in areas of potential effect for all new undertakings and sites in the vicinities of these projects would be evaluated for direct and indirect impacts.

3.4.12.3.1 Alternatives 1-4 Effects

Past impacts, other than natural occurrences, that can cause negative effects to cultural resources include looting and vandalism, animal congregation, recreational activities and range projects. These actions can also contribute to present and future impacts. There are no range improvements proposed under this alternative and there are no other known undertakings planned for the general area that would affect cultural resources; therefore, significant cumulative impacts are not expected to occur.

3.4.12.3.2 Alternative 5 Effects

Due to the absence of livestock and any proposed ground disturbing projects, significant cumulative impacts would not occur under this alternative. Other impacts, such as disturbances from recreation and surface artifact collection may continue, but these effects tend not to be significant.

3.5 Garat Allotment (0584)

3.5.1 Rangeland Vegetation, Including Noxious Weeds and Invasive Plants

3.5.1.1 Affected Environment

The Rangeland Health Assessment (USDI BLM, 2012b) and Determination (Appendix J) were completed for the Garat allotment in 2012. The Assessment and Evaluation Report identified that the Idaho Standards for Rangeland Health Standard 4 – Native Plant Communities was not being met in the allotment. The standard was not met within pastures 3, 5, and 6, where the departure of biotic indicators from site potential is moderate. Additionally, portions of pastures 5 and 6, with cheatgrass present in higher-than-expected amounts, failed to meet the standard due to past fire and historic grazing treatments implemented within a few years following historic fires. Trend plots in pasture 4 identify a consistent downward trend in the frequency of bluebunch wheatgrass and Idaho fescue between 2003 and 2009. Current livestock grazing management practices (lack of periodic rest and/or deferment from livestock grazing) are identified as significant causal factors for not meeting Standard 4 within pasture 4.

In addition, current livestock management practices failed to meet the Idaho guidelines for livestock grazing management and contribute to not meeting the ORMP management objective for vegetation. The management objective for vegetation identified in the ORMP is to improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas. Ecological condition of vegetation communities within the allotment was mostly in early to mid-condition at the time the ORMP was adopted (1999), with only 25 percent of the allotment in late ecological status and no portion of the allotment categorized in potential natural condition.

As noted in the Evaluation Report, vegetation communities with a full complement of dominant grasses and shrubs consistent with the natural variability of the reference site are not present within the allotment, and a minor component of invasive species is recorded. As a whole, sagebrush steppe vegetation communities within the allotment exhibit vegetation functional-structural groups that vary from site potential, with an underrepresentation of dominant deep-rooted bunchgrass species for the sites, primarily bluebunch wheatgrass, Thurber's needlegrass, and Idaho fescue, and a greater representation of Sandberg bluegrass, a shallow-rooted native bunchgrass, than the minor component described in ecological site descriptions for the reference sites. Native perennial vegetation communities, within sites other than those identified above that did not meet the standard, continue to meet Rangeland Health Standard 4 with healthy, productive, and diverse populations of remaining native plants, although they are in a depressed condition from the reference site conditions. The current vegetation communities within remaining portions of the allotment retain an adequate composition of native perennial species to conclude that proper nutrient cycling, hydrologic cycling, and energy flow are provided.

As also stated in the evaluation report, recorded upland trend that is static or, at best, only slightly upward, indicates that livestock management practices may not provide adequate rest or deferment from livestock grazing use during the active growing season, especially within pasture 4, where downward trend in frequency of deep-rooted bunchgrass species was recorded. Planned implementation of a rest-rotation grazing schedule for four of the six pastures in the allotment, and recent implementation of rest in less than the planned 1-of-3-years cycle, may not provide adequate opportunity for recovery of plant health and vigor following repeat years of active growing season use. A number of sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season and providing at least 2 years of deferment for every year of active growing season use (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (USDA NRCS, 2012).

Ecological sites and vegetation condition

The vegetation types and ecological sites for public lands within the southern portion of the Owyhee Field Office, including the Garat allotment, were described in a vegetation inventory and analysis (1977 to 1979) using methodologies described in the Bruneau-Kuna Grazing Environmental Impact Statement Draft (USDI BLM, 1982). Ecological site potential and succession, as well as an introduction to state-and-transition models for low sagebrush/bunchgrass and big sagebrush/bunchgrass ecological sites are provided in Appendix M. Table VEGE-7 provides a listing of ecological sites described, a summary of dominant potential vegetation, and acreage for the Garat allotment (Map ECOL-2).

Table VEGE-7: Ecological sites mapped for the Owyhee Field Office, Garat allotment

Ecological Site	Dominant Species Expected	Acres [1]	Percent of Allotment
Churning clay 12-16" ARCA13/POA	silver sagebrush; Nevada bluegrass	175	<1
[3] Clayey 12-16" ARARL/FEID	alkali sagebrush; Idaho fescue	6,100	3
[3] Shallow claypan 11-13" ARAR8/PSSPS	low sagebrush; bluebunch wheatgrass-Sandberg bluegrass	54,357	26
[3 4] Shallow claypan 12-16" ARAR8/FEID	low sagebrush; Idaho fescue-bluebunch wheatgrass	9,051	4
[2 3] Loamy 8-12" ARTRW8/PSSPS-ACTH7	Wyoming big sagebrush; bluebunch wheatgrass-Thurber's needlegrass	21,483	10
[3] Loamy 10-13" ARTRW8/PSSPS	Wyoming big sagebrush; bluebunch wheatgrass	110,398	52
[3 4] Loamy 16+ ARTRV/FEID	Mountain big sagebrush-bitterbrush; Idaho fescue-bluebunch wheatgrass	22	<1
Loamy bottom 12-16" ARTRT/LECI4	Basin big sagebrush; basin wildrye	3,705	2
Unclassified		6,375	3
Total		**211,666**	**100**

[1] Acreage includes all ownerships.
[2] The Loamy 8-12" is described within Major Land Resource Area B11, while the remaining ecological sites are described within Major Land Resource Area D25
[3] Ecological site descriptions identify a state-and-transition model with increasing Sandberg bluegrass resulting from improper grazing management, which if continued and with fire can retrogress through phases and could transition to a new grazing resistant state with Sandberg bluegrass as the understory dominant and with cheatgrass. (95 percent of acres within Garat)
[4] Ecological site descriptions identify a state-and-transition model with potential for juniper encroachment. (4 percent of acres within the Garat allotment)

In addition to mapping ecological sites listed in Table VEGE-7 above, the vegetation inventory completed in the late 1970s included the assessment of range condition classes. Range condition class data are summarized for public land, which includes the Garat allotment in the Bruneau-Kuna Grazing Environmental Impact Statement Draft (USDI BLM, 1982). These data were updated and ecological condition was reported by allotment in the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement (USDI BLM, 1999b). Ecological condition is based on a similarity index which compares the plant community present to the historic potential natural community for that ecological site. The similarity index to the historic climax plant community is the percentage by weight of annual production of plant species present at the inventoried site. Table VEGE-8 is a summary of ecological condition within the Garat allotment from locations sampled during the vegetation inventory completed in the late 1970s and updated during development of the ORMP (USDI BLM, 1999a).

Table VEGE-8: Ecological condition for public lands in the Garat allotment

Allotment	**Ecological Status (Acres / Percent)**				**Treated Lands [2]**
	Early Seral	**Mid-Seral**	**Late Seral**	**Potential Natural Condition**	
Garat Allotment (0584)	47,974 / 24	91,244 / 45	50,691 / 25	0 / 0	12,855 / 6

[1] Ecological status is based on a similarity index to a reference community, in most cases the historic climax plant community or potential natural community (BLM Ecological Site Inventory Handbook: 1734-7). A similarity index of 0-25% is early status; A similarity index of 26-50% is mid status; A similarity index of 51-76% is late status; A similarity index of 77-100% is potential natural community.
[2] Treated lands include those where brush control treatments or seedings preclude classification within one of the conditions classes.

Production data from the 1970s inventories indicate that many sagebrush/bunchgrass communities within the Garat allotment were less productive than the reference site described in ecological site descriptions. These data reveal that the majority of sites sampled exhibited a reduced dominance by deep-rooted bunchgrasses and a commensurate increase in sagebrush, shallow-rooted grasses, or both[54]. Localized areas may have crossed the threshold to the identified states dominated by Sandberg bluegrass, squirreltail, annual grasses, and annual forbs in the understory, with or without sagebrush or root-sprouting shrubs such as rabbitbrush in the shrub layer, as a result of historic improper livestock grazing and/or altered fire return intervals. The vegetation shift away from the reference plant communities noted for the Garat allotment likely occurred in the late portion of the 19th century and the early years of the 20th century, a period when public-land livestock grazing was controlled little and stocking rates were high (Vavra, Laycock, & Pieper, 1994).

In addition to BLM vegetation inventories, data recorded by Western Range Services from 1997 through 2009 identify static or slightly improving ecological status at a limited number of the BLM vegetation inventory sites sampled in the 1970s (Western Range Services, 1997) and at BLM key areas where trend monitoring points are established (Western Range Services, 2011). Western Range Services, in coordination with BLM, re-inventoried vegetation condition in 1997 at 12 BLM sites in the Garat allotment sampled in the late 1970s. In addition, vegetation condition was inventoried at the sites of BLM trend plots. Data were used to identify trends in ecological status at sample sites used in the 1970s and to correlate ecological condition at BLM trend plots to the 1970s BLM inventory sites. Western Range Services reported one class in ecological condition improvement at four of the 12 BLM inventory sites between 1979 and 1997, while the remaining eight sites were reported in the same class recorded in 1979. Between 1997 and 2009, Western Range Services reported maintenance or improvement in ecological status at 11 of 12 BLM trend sites. Data for the intermediate changes between 1997 and 2003, the intermediate changes between 2003 and 2009, and confidence intervals calculated for these changes varied greatly and often did not remain consistent at any one site. The consultant's data, further analyzed by BLM, identify a dominance of Sandberg bluegrass in 1997 and continuing through the most recent monitoring in 2009 at all sites. Deeper-rooted bunchgrasses that are supposed to be co-dominant in the

[54] Analysis of production data is on file in the project record and is available to the public upon request.

reference site at potential for all ecological sites (bluebunch wheatgrass, Idaho, fescue, and Thurber's needlegrass) have remained present, though with reduced dominance.

Additionally, current vegetation in the Garat allotment [based on mapping done by the Pacific Northwest National Laboratory (PNNL) from 2000/2001 Landsat satellite imagery and updated for vegetation treatments and fire] is shown in Table VEGE-9.

Table VEGE-9: Current Vegetation in the Garat Allotments (based on PNNL data as updated)

Vegetation Cover Type	Acres	Percent of Allotment
Juniper	459	<1
Mountain big sagebrush	854	<1
Basin/Wyoming big sagebrush	122,622	58
Low sagebrush	56,095	27
Bitterbrush	239	<1
Bunchgrass	5,062	2
Rabbitbrush	23,387	11
Greasewood	269	<1
Salt desert shrub	1	<1
Wet meadow	308	<1
Mountain shrub	7	<1
Exotic annuals	1,535	1
Aspen	4	<1
Sparse veg	677	<1
Water	147	<1
Total:	**211,666**	**100%**

The differences between potential vegetation mapped in ecological site inventories and the current vegetation identified in PNNL data are indicated by comparing Tables VEGE-7 and VEGE-9. Ecological site and PNNL mapping were completed at different scales and with different vegetation classification systems. Precise comparison of the two tables is not possible, but general differences in plant community structure and composition are apparent between potential vegetation and current vegetation. In general, past disturbances are evident when comparing the two tables. Past fires and other disturbances are indicated by the presence of exotic annuals, bunchgrass communities lacking a significant shrub component, and the dominance of green rabbitbrush in the current vegetation.

Although not apparent in a comparison of Table VEGE-7 (ecological site potential) and Table VEGE-9 (current vegetation data), many sagebrush/bunchgrass ecological sites within the Garat allotment are currently supporting a vegetation community with a greater-than-site-potential component of Sandberg bluegrass, squirreltail, and cheatgrass, while bluebunch wheatgrass, needlegrass, or Idaho fescue dominance is generally reduced. The assessment of rangeland health completed in the January 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012b) for the six pastures of the Garat allotment identifies this condition. Only two ecological sites present in the Garat allotment have Sandberg bluegrass or Nevada bluegrass as the dominant or co-dominant bunchgrass species (Table VEGE-4). Ecological site descriptions covering 95 percent of the acreage in Garat allotment describe retrogression from a more productive reference phase to a Sandberg bluegrass-dominated phase in the presence of disturbances such as improper grazing management. With continued disturbance, primarily improper grazing management, further retrogression would result in the transition to a state from which it is economically impractical to return to the reference state with accelerated practices.

Potential forage production

The potential production of forage species in the Garat allotment, based on ecological site descriptions listed in site guides (USDA NRCS, 2010) and the proportion of each ecological site represented in the allotment, provides an estimated average annual production of 415 pounds of grass and grass-like species per acre in the normal year. The amount of forage necessary to support one AUM is 1,000 pounds and the maximum allowable utilization limit of 50 percent[55], so approximately 4.8 acres would be required to support one AUM, assuming all ecological sites in the allotment were at site potential, livestock distribution was equal throughout the allotment, and management objectives maximized livestock production. Conservative stocking is a term commonly used by range researchers to define a level of grazing between light and moderate, generally involving about 30 to 40 percent use of forage (Appendix M). With a maximum allowable utilization to 35 percent, approximately 6.9 acres would be required to support one AUM, assuming ecological condition was at reference site conditions and with equal livestock distribution throughout the allotment.

Vegetation inventory data recorded for the Garat allotment in the late-1970s identify that the ecological condition at many inventoried sites sampled was largely influenced by the presence of shrub species and shallow-rooted bunchgrass species, with a reduced dominance by deep-rooted bunchgrass species. Sagebrush and shallow-rooted bunchgrass dominance has persisted, with the exception being within the perimeter of wildfires. Deep-rooted bunchgrasses have not recovered to ecological site potential (USDI BLM, 2012b). The presence of sagebrush and shallow-rooted bunchgrasses and the greatly reduced occurrence or dominance by native perennial deep-rooted bunchgrass species, the primary forage species supporting authorized levels of livestock grazing, is reflected in the early to mid-ecological condition recorded for much of the Garat allotment. As a result, the lack of the potential co-dominance by native deep-rooted bunchgrass species greatly reduces the production of forage from the allotment as compared to ecological site potential. In addition, livestock do not equally distribute grazing use throughout any pasture, resulting in areas of lighter use and areas of heavier use.

Conclusion

To summarize, the Garat allotment is not meeting the Standard for Native Plant Communities (Standard 4) in pasture 4 because current livestock management practices, primarily frequent grazing use during the active growing season, have reduced the health and vigor of native perennial bunchgrass species that should be co-dominant with sagebrush. Additionally, Standard 4 was not met within pastures 3, 5, and 6, where the departure of biotic indicators from site potential is moderate, and in portions of pastures 5 and 6, with cheatgrass present in higher-than-expected amounts.

Remnant native perennial vegetation in remaining portions of the allotment continue to support proper nutrient cycling, hydrologic cycling, and energy flow adequate to meet Standard 4, even though vegetation communities have shifted to a greater dominance of shallow-rooted native perennial bunchgrass species and nonnative annuals and a decline in larger deep-rooted native perennial bunchgrasses described in ecological site descriptions for the reference site conditions. Vegetation communities with a full complement of dominant grasses and shrubs consistent with the natural variability of the reference site are not present within the allotment. As a whole, sagebrush steppe vegetation communities within the allotment exhibit vegetation functional-structural groups that vary from site potential. Recorded upland trend that is static or, at best, only slightly upward, leads to a concern that livestock management practices do not provide adequate rest or deferment from grazing during the active growing season. Planned implementation of a rest-rotation grazing schedule for four of

[55] A management action listed in the ORMP to meet the livestock grazing management objective is to limit upland forage utilization by livestock on key herbaceous forage species to 50 percent unless a higher or lower level of use is appropriate to meet standards for rangeland health.

the six pastures in the allotment, and recent implementation of rest in less than the planned 1-of-3-years cycle, may not provide adequate opportunity for recovery of plant health and vigor following repeat years of active growing season use.

Weeds

In Idaho, the BLM works closely with the Idaho Department of Agriculture, Tribal governments, and county governments to combat noxious weeds. Cooperative weed management arrangements utilize local, state and Federal resources to inventory and treat weed infestations on both public and private lands. Populations are recorded, treated, monitored, and retreated as their presence is known. Undiscovered noxious weeds may also exist. Isolated locations of diffuse knapweed and Scotch thistle have been identified and treated in pasture 6 of the Garat allotment within the past 10 years. A number of additional locations of tamarisk, Canada thistle, yellowstar thistle, and perennial pepperweed have been identified in the Owyhee River Canyon and South Fork Owyhee River Canyon within and adjacent to the Garat allotment. Noxious weed control is ongoing in this area.

Invasive annual species, including cheatgrass and a number of nonnative annual forbs, are present in the Garat allotment, as noted in the 2012 evaluation report (USDI BLM, 2012b). Areas where these species dominate were identified in portions of pastures 5 and 6.

3.5.1.2 Direct and Indirect Effects

Analyses of Alternative 1 and the action alternatives 2 through 5 are based on consequences of seasons and intensities of livestock grazing use provided in earlier sections of the EA and Appendix M, including the vegetation Affected Environment section for the Owyhee River group of allotments (Section 3.3.1.1) and the vegetation Affected Environment section for the Garat allotment (Section 3.5.1.1). In addition, Appendix M provides ecological concepts for expected vegetation change resulting from livestock management practices.

3.5.1.2.1 Alternative 1 Effects

Implementation of Alternative 1 would continue current livestock management actions, which would maintain the current conditions explained in the Affected Environment section above. Alternative 1 only differs from terms and conditions of current permits with a small reduction of livestock numbers and the resulting reduction of active use AUMs authorized. Impacts to health and vigor of native perennial bunchgrasses, preferred forage plant species, would occur with two consecutive years of scheduled growing season use of each 3 years in 4 of the six pastures of the allotment. Opportunity for recovery from growing season impacts would be limited to 1 year of rest from livestock grazing in each 3-year period in these pastures. The slight to light utilization of key forage plants documented with recent management would be expected to continue (See Appendix B). These livestock management practices would be expected to contribute toward failure to meet Standard 4 and would continue to limit improvement in upland condition and trend, as noted in the 2012 Evaluation Report (USDI BLM, 2012b). Frequent livestock grazing of native perennial bunchgrass species during the active growing season would limit improvement in upland condition and trend, when combined with recorded levels of utilization.

Seasons of grazing use

Livestock grazing results in selective removal of more palatable plants and portions of plants. The forage species preferred by livestock changes through the phenological stages of growth of the variety of species available, resulting in continued change in the plant species selected through the grazing period. As identified in Appendix M, active growing season use has a great potential to impact vigor and health of bunchgrass species. The pasture rotation scheduled under Alternative 1 averages 2 consecutive years of growing season use within pastures 1, 2, 3, and 4 of the allotment, followed by a full year of rest from livestock grazing. This rotation would result in more palatable bunchgrass species, primarily bluebunch wheatgrass, being repeatedly defoliated during the active growing season, and they would not be able to either fully express growth or improve vigor. Regeneration and establishment of new individuals in vegetation communities would also not occur with this alternative. Removal of photosynthetic material during the active growing season requires the plant to replace leaf surface and tillers, the active photosynthetic plant parts. Scheduled rest in 1 of 3 years in these pastures would provide limited opportunity for recovery. In addition, the scheduled year of rest would provide carry-over forage that would supplement forage production during growing season use the following year. This alternative would not provide sufficient opportunity for bluebunch wheatgrass recovery, based on recommendations by a number of sources (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012). These sources recommend grazing no more than 1 of 3 years during the active growing season. Continuation of flexibility in the grazing schedule recently implemented would result in additional active growing season use in these pastures (Appendix B), further impairing perennial bunchgrass health and vigor.

Annual grazing use of the Big Horse and Juniper Basin pastures later in the grazing season, with some use scheduled for the end of the active growing season (late June) would defer the majority of grazing use to a period outside the active growing season in most years and allow nearly full expression of growth and vigor of perennial species. Opportunity for regeneration and development of new individuals in vegetation communities would be provided.

Intensity of grazing use

Recorded utilization levels at stocking rates under the existing permit have been within the slight (6 to 20 percent) and light (21 to 40 percent) categories (Appendix B). The scheduled grazing use and livestock numbers identified in Alternative 1 would result in approximately 10.7 public land acres in the Garat allotment used to support one AUM, including the acreage from scheduled rest of pastures in the rotation. The number of acres within individual pastures of the Garat allotment scheduled through the 6-year rotation of Alternative 1 to support one AUM is greatest, at 15.5 acres, in pasture 3, when it is scheduled for grazing, and the least, at 7.0 acres, in pasture 6, during 2 years of the 3-year rotation.

Past stocking rates, as carried forward in Alternative 1, are not expected to result in negative impacts to vegetation resources due to utilization levels alone. The continuation of past grazing practices, with the number of livestock authorized to graze within the allotment unchanged from recent actual use, is expected to result in levels of utilization consistent with recent recorded utilization levels, all less than the moderate category and generally consistent with conservative stocking (Appendix M). Impacts to health and vigor of native perennial species from frequent grazing use during the active growing season, as identified above, would be compounded by growing season levels of utilization greater than the slight to light categories.

Weeds

Alternative 1 also includes the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions. Although the presence of cheatgrass and other invasive annual species was identified in the 2012 Rangeland Health Assessment and Evaluation Report for this allotment, with portions of pastures 5 and 6 dominated by cheatgrass (USDI BLM, 2012b), current livestock management practices were not found to contribute to their introduction or spread.

Livestock may spread weeds and invasive species through transport on fur and on hoofs, as well as through ingestion and later defecation of viable seeds. This transport can occur from sources used prior to scheduled use of public land, between sites within the allotment, or to locations outside the allotment at the end of the grazing season. Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel provides sites for establishment of weeds and invasive species.

The level of risk associated with implementation of Alternative 1 is proportional to the number of livestock authorized to graze within the allotment and the concentration of soil disturbance. Alternative 1, which authorizes of annual grazing use of 18,870 AUMs, would result in risk for introduction of weeds and spread of existing weeds equivalent to that risk with implementation of the performance-based alternative because authorized levels of use would be similar. Risks of weed and invasive species introduction and spread would be greater, with significantly higher stocking rates and potential for increasing stocking rates in the applicants proposed action, those risks would be reduced with lower stocking rates in the season-based alternative. Those risks would be eliminated in the no-grazing alternative.

Conclusion

Under Alternative 1, native vegetation condition would not improve. Past livestock management practices in pasture 4 that contributed to the failure to meet Standard 4, primarily frequent grazing use during the active growing season, would continue, and the allotment would continue to fail to meet Standard 4 for the same reasons. The static to slightly upward trend in condition of vegetation resources in the allotment recorded in trend studies and ecological status studies, with instances of periodic downward trend in some locations (e.g., recently reported downward trend for pasture 4), would be expected to continue with unchanged implementation of livestock management practices. The Idaho Rangeland Health Standard for native plant communities would likely continue to be met in some portions of the allotment, but historic and current livestock grazing management practices, in addition to altered natural fire return intervals, would continue to limit opportunity to meet the standard in other locations within the allotment. The native vegetation condition of pastures 1, 2, 3, and 4, grazed frequently during the active growing season, would not improve and would lead to portions of the allotment remaining in early to mid-ecological condition with limited improvement, at best. When livestock management actions under Alternative 1 are considered against the grazing response index suggested by Reed and others (1999), the likelihood for frequent grazing of individual plants during the growing season (more than 3 times) and the lack of opportunity for regrowth following scheduled grazing use combined in 2 of 3 years of the grazing schedule indicate that planned management would be harmful. The ORMP management objective to improve unsatisfactory vegetation health/condition would not be met. In the absence of actions to reduce stressors to biotic function induced by livestock management practices, downward trend would be anticipated as a result of stressors induced by climate change, primarily altered precipitation and temperature regimes, and exacerbated by livestock management practices as identified above. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

3.5.1.2.2 Alternative 2 Effects

Implementation of the applicant's proposed action would result in an initial increase of active grazing use (allotment-wide stocking rate) by 21 percent when compared to Alternative 1. Alternative 2 would also establish protocols for additional increases in active grazing use at 5-year intervals over the term of the permit and longer. In addition, Alternative 2 would implement a grazing schedule similar to the schedule under Alternative 1.

The combined consequences of implementing a grazing schedule similar to the schedule in Alternative 1 that does not provide adequate opportunity for perennial species to recover from growing season grazing and the increased intensity of grazing resulting from the higher active use would not allow the health and vigor of native perennial species to improve. Protocols for short-term implementation monitoring and long-term effectiveness monitoring would limit periodic increases in active use to the level that would continue to meet management objectives, including Rangeland Health Standards.

Alternative 2 would not allow improvement in pasture 4 or progress toward meeting Standard 4. The remaining portions of the allotment may continue to meet the Idaho Rangeland Health Standard for native plant communities with implementation of the applicant's proposed action. The condition of vegetation communities may be maintained, although progress toward a full complement of native perennial species consistent with ecological site potential would not result. The condition of all pastures of the Garat allotment would not improve as a result of flexibility to be grazed in successive years during the active growing season.

Seasons of grazing use

The applicant's proposed grazing schedule would be similar to the schedule under Alternative 1. The schedule under Alternative 2 would result in livestock rotation among pastures of the allotment that would retain flexibility to graze native perennial vegetation communities frequently during the active growing season. Although rest in 1 of each 3-year period is scheduled for pastures 1, 2, 3, and 5, growing season grazing in the remaining 2 years of each 3-year cycle does not provide the opportunity for recovery consistent with recommendations by a number of sources (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012). Accordingly, under Alternative 2, health and vigor of native perennial plants would not be maintained. Progress toward meeting the ORMP vegetation objective to improve vegetation condition would not occur in pastures 1, 2, 3, and 5.

Similarly, deferment of grazing use to a period outside the active growing season in 1 of 3 years or rest in 1 of 5 years, as proposed for pasture 4, does not provide adequate opportunity for recovery of health and vigor for native perennial species. Finally, this alternative grants flexibility to graze pastures 4 and 6 beginning early in the active growing season in years when water is scarce in other pastures that are scheduled for spring use (start of grazing by May 16). This would fall short of meeting requirements for periodic rest or deferment, especially in years of limited livestock water, which are generally also years of drought and reduced effective soil moisture for plant growth. When the combined effects of drought and growing season grazing use are compounded, health and vigor of native perennial bunchgrasses and palatable forbs would be expected to decline.

The applicant's proposed action would also provide flexibility in move dates between pastures to further limit the frequency of active growing season use, while remaining within terms and conditions in the application and permit. In the event that the permittee used this flexibility, limitation of growing season impacts to native perennial species would more closely meet perennial plant requirements. Opportunity to use flexibility to meet recommendations for no more than 1 year of grazing use during the active growing season in each 3-year period may be limited by the livestock numbers authorized and the size of pastures available in the Garat allotment.

The applicant's proposed action also requests additional flexibility outside the parameters identified in the application under the sections titled Permitted Use, Other Terms and Conditions, and Grazing Strategy that could be approved by the authorized officer upon prior notification by the permittee. Potential impacts to vegetation resources resulting from this additional undefined flexibility are beyond the analysis of this EA and could not be authorized in the absence of appropriate analysis in accordance with NEPA.

The grazing schedule proposed in Alternative 2 would result in reduced vigor and health of native perennial species, unless the permittee would implement flexibility in the schedule to rest pastures more frequently than scheduled or defer grazing use until after the active growing season in alternate years or more frequently. Without the flexibility in the grazing schedule to meet perennial plant needs for recovery from growing season use, neither Standard 4 nor the ORMP objective for vegetation would be met because frequent livestock grazing of perennial plants during the active growing season would reduce their health and vigor.

Intensity of grazing use

The applicant's proposed action would initially increase the active use authorized within the allotment by 21 percent, with protocols for periodic evaluation to identify additional increases in active grazing use over the 10-year term of the permit and longer. The 2012 Evaluation Report and Determination do not support an increase in active use, with Standard 4 not being met due to current livestock management practices and ORMP vegetation management objectives not being met. The initial increase would result in stocking the allotment at 8.9 acres per AUM and would include the potential to reduce that over the term of the permit and to continue those reductions to as little as 6.0 acres per AUM in 20 years or more, with periodic increases in active grazing authorization. Utilization levels would be expected to increase, consistent with the gradual increase in active use. As noted above, under ideal conditions, approximately 4.5 acres would be required to support one AUM in the allotment, assuming all ecological sites in the allotment were at site potential, livestock distribution were equal throughout the allotment, and utilization of available forage were 50 percent. The potential to graze the allotment at a stocking rate of 6.0 acres per AUM would require intensive livestock management. That level of active grazing authorization would not likely be supported by the forage production expected, based on the early to mid-ecological condition of most of the allotment and with consideration for portions of each pasture that are less accessible for livestock grazing due to distance from water and topography.

Unlike Alternative 1, the applicant's proposed action, with a 21 percent initial increase in levels of use, would increase the likelihood that utilization levels in some pastures and in some years would reach or exceed the maximum allowable limit of 50 percent established in the ORMP to meet vegetation management objectives[56]. At a minimum, the initial increase in active grazing use authorization or potential additional increases through the term of the grazing permit would result in the recorded utilization levels in some pastures that periodically exceed the conservative stocking rate recommended by range researchers (Appendix M).

The combined use of the proposed evaluation process at 5-year intervals to identify if resource management objectives are met, followed by application of a limit to the maximum allowable utilization level, would retain stocking rates and utilization of forage resources at appropriate levels or adjust them to levels within the ability of the vegetation communities to maintain vigor and health of perennial species[57][58]. The utilization limiting tool was designed to meet a number of resource management objectives, including maintenance and improvement of perennial vegetation. Incentives would be provided to maintain utilization levels below the maximum allowable limit of 50 percent established in the ORMP and the 40 percent level needed to support periodic increases in active grazing use. The application of long-term monitoring to evaluate if livestock management practices are allowing resource objectives to be met, in conjunction with short-term utilization monitoring, would provide opportunity to assess whether the limits set by the utilization tool are appropriate to meet objectives or if more

[56] The permittee's application includes tables of expected utilization levels if livestock grazing would be increased to 22,750 AUMs and 33,646 AUMs, based on recent utilization levels recorded by Western Range Services and by BLM. Utilization data used to calculate those values were averaged for the allotment from recent data recorded for a number of key species and a number of pastures. Calculation of expected allotment-wide utilization with proposed increases in active grazing use cannot be substituted for expected utilization levels when one focuses management of the pasture on a key species.

[57] The application substitutes periodic monitoring of change in ecological status as the primary method that would be used for trend monitoring and renders nested frequency monitoring used by the BLM field office as a supplemental method which may be used at BLM discretion.

[58] Although the application for grazing permit renewal identified the Key Species method for utilization measurement, the application expanded the application of methods with guidance that the Height-Weight method would be used to increase accuracy and reduce observer bias. The grazing permit application discounts the protocols in the Key Species Method to use utilization class descriptions, resulting in a change from the Key Species method use by the BLM field office to the Height-Weight method.

conservative stocking rates may be more appropriate within the sagebrush-steppe communities present in the Garat allotment.

As a result of the periodic increases in active grazing use that would approach the limits of stocking rates that continue to allow management objectives for vegetation resources to be met, the ecological condition of native upland vegetation communities would be expected to improve at a slower rate than with implementation of Alternative 1, due to the proposed increased stocking rate and resulting moderate utilization levels. It is anticipated that periodic evaluations at 5-year intervals would eventually lead to a finding that sequential increases in active use no longer result in meeting vegetation management objectives and the Idaho rangeland health standard for native plant communities. Based on the ecological site description and the potential forage production, ORMP vegetation management objectives or Standard 4 would no longer be met at some time prior to the full increase of active use by 78 percent in 20 years or more.

Weeds

The applicant's proposed action includes the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions as identified in Alternative 1, although with livestock numbers increased by 21 percent and the potential to increase livestock numbers by 78 percent over 20 years or more, that risk is increased as compared to Alternative 1, due to greater soil surface disturbance and more animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

The 2012 Evaluation Report and Determination do not support the requested increase in active use, with the allotment failing to meet Standard 4 (due to current livestock management practices) and ORMP vegetation management objectives. Alternative 2 would not allow improvement in pasture 4 or progress toward meeting Standard 4. The season of scheduled grazing would be changed little as compared to Alternative 1, while the anticipated utilization level would increase initially and potentially increase more long-term. The combined impacts of frequent livestock grazing during the active growing season and the higher intensity of grazing impacts to vegetation resources would combine to prevent improvement of the health and vigor of native perennial species. Although the Idaho Rangeland Health Standard for native plant communities may continue to be met in remaining portions of the allotment with implementation of the applicant's proposed action, and the condition of vegetation communities may be maintained, progress toward a full complement of native perennial species consistent with ecological site potential would not result. The condition of all pastures of the Garat allotment would not improve as a result of flexibility to be grazed in successive years during the active growing season. Frequent livestock grazing during the active growing season would lead to a portion of the allotment remaining in early to mid-ecological condition. As livestock numbers were allowed to increase, provided that management objectives could be met, the margin for meeting resource management objectives for vegetation and the rangeland health standard for native plant species would be narrowed. The increase of stressors to biotic function induced by livestock management practices, less scheduled rest and increased livestock numbers as compared to Alternative 1, would result in an anticipated downward trend when added to additional stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

3.5.1.2.3 Alternative 3 Effects

Although the performance-based alternative has the same season of use, livestock number, and AUM terms and conditions as Alternative 1, Alternative 3 also includes performance-based terms and conditions that limit the intensity of grazing use on upland vegetation, riparian resources, and special status species habitats. These performance-based terms and conditions would provide substantial improvement to native plant communities under this alternative when compared to current conditions. Though Alternative 3 includes a 3 percent increase in active use when compared to Alternative 1, the stocking rate for the allotment would be nearly equal to stocking rates identified in current permits to graze livestock in the allotment, and BLM determined that those stocking rates are not necessarily inconsistent with plant health. In any case, the performance based terms and conditions (terms and conditions 12 through 14 on the permit) will protect and enhance native plant communities.

Under Alternative 3, the growing season utilization limits in upland vegetation communities, riparian grazing use limitations, and limitation of grazing use in sage-grouse habitat would improve upland vegetation and native plant communities because the intensity of grazing use during the active growing season would be reduced and native perennial species would be allowed to complete the annual growth cycle, with limited need to replace photosynthetic surface area midway through the growing season. Specifically, in addition to the indirect effects to upland vegetation resources of limiting the intensity of grazing use of riparian vegetation and vegetation that provided wildlife habitats, the utilization limit (≤20 percent), would require more intensive livestock management practices to distribute livestock and associated impacts more evenly throughout each pasture or result in location-specific and permittee initiated reductions in livestock use. Greater distribution of livestock or permittee-initiated reductions would result in reduced impacts to vegetation resources from livestock grazing and trampling, especially during the active growing season. Limitations on growing season utilization would allow the allotment to meet the Idaho rangeland health standard for native plant communities and the ORMP vegetation management objective over the term of the grazing permit.

Seasons of grazing use

The grazing schedule identified under Alternative 1 would also be implemented under Alternative 3. The analysis of consequences to vegetation resources of implementing the seasons of use for each pasture of the allotment are presented for Alternative 1 above. Some sources (Holechek, Gomez, Molinar, & Galt, 1999) (Holechek, Thomas, Molinar, & Galt, 1999) identify the benefits of limiting stocking rates or utilization levels, rather than limiting grazing of bluebunch wheatgrass to no more than 1 in 3 years during the active growing season or defining seasons of grazing use, to allow grass species recovery and maintenance of health and vigor. Impacts from seasons of use under Alternative 3 would be similar to those identified for Alternative 1, although the combined effect of seasons and intensities of grazing use would differ as discussed below and in Appendix M.

Intensities of grazing use

The initial stocking rate in Alternative 3 for individual pastures of the allotment would be between 6.5 and 14.3 acres per AUM, slightly less than the acres per AUM under Alternative 1, as a result of the 3 percent greater authorized active use. At these stocking rates and in the absence of changes to livestock management practices, utilization levels would be expected to exceed the 20 percent maximum allowable performance-based term and condition in pastures used during the active growing seasons. This conclusion is reached because recorded utilization of key species in pastures used during the active growing season in recent years has repeatedly exceeded 20 percent, as summarized in Table-VEGE-10.

Table-VEGE-10: Recorded utilization of bluebunch wheatgrass and Idaho fescue in pastures grazed during the active growing season (5/1 to 7/1)

Pasture	Year	Reported use dates	Recorded Utilization Bluebunch Wheatgrass
#1 Dry Lake and #2 Piute Creek	2005	3/15 to 7/9	No data
	2006	3/27 to 7/8	No data
	2007	3/15 to 7/9	34

Pasture	Year	Reported use dates	Recorded Utilization Bluebunch Wheatgrass
	2009	3/16 to 7/9	22
	2010	3/21 to 7/7	16
#3 Forty-five	2005	3/15 to 7/11	No data
	2007	3/19 to 6/1	34
	2008	3/27 to 7/14	20
	2009	3/20 to 7/6	22
	2011	3/21 to 7/15	No data
#4 Kimball	2005	3/18 to 7/15	No data
	2006	3/18 to 7/15	No data
	2007	4/17 to 8/30	No data
	2008	5/12 to 8/23	34
	2010	3/24 to 7/14	15
	2011	5/18 to 9/12	31
#5 Big Horse	2006	3/15 to 6/27	No data
	2008	3/22 to 5/15	No data
	2011	3/17 to 7/1	No data

Increased intensity of livestock management practices to retain utilization levels below the threshold of the performance based term and condition during the active growing season would ensure that plants are used at a slight or lower level (≤20 percent). The reduction in growing season utilization levels from current levels (Table VEGE-5) to less than 20 percent equates to removal of a smaller portion of photosynthetically active leaf surface area and removal of fewer tillers. Limitation of the utilization level during the active growing season would reduce the need for native bunchgrasses to replace leaf material removed during the active growing season and the initiation of new tiller development midway through the active growing season. Interruption of photosynthetic capacity during the active growing season would have less impact than that found under higher utilization levels of Alternative 1. Limiting utilization to less than 20 percent would lead to fewer plants grazed during the boot stage, the more critical portion of the active growing season. As a result of reduced active growing season utilization levels, health and vigor and recovery of deep-rooted bunchgrass plants would be expected in pastures 2, 3, and 4, all scheduled to be grazed during the active growing season 2 of every 3 years. Year-long rest scheduled 1 of every 3 years would additionally benefit the recovery of ecological status and health of native upland vegetation communities as identified in the Current Situation alternative.

Retention of the maximum allowable utilization limit of 50 percent for pastures grazed during periods outside the active growing season would retain standing plant material and litter to protect soils from erosion and also protect soil properties, indirectly benefiting native perennial vegetation health and vigor.

Compliance with performance-based terms and conditions for riparian resources and special status species habitat would also result in lower intensities of use of native perennial species. These terms and conditions may often limit grazing use in pastures where these resources are present before maximum allowable utilization levels are reached.

The ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be improved in years with limited soil moisture.

Weeds

Actions of Alternative 3 include the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions as identified in Alternative 1. With livestock numbers increased by 3 percent as compared to Alternative 1, that risk is slightly increased due to greater soil surface disturbance and more animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

Under Alternative 3, the Idaho Rangeland Health Standards for native plant communities would be met over the 10-year term of the grazing permit, including pasture 4 where the standard was not met due to current livestock management practices. The condition of pastures 1, 2, 3, and 4, with limitations to utilization during the active growing season, would improve and lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result in the long term (the 10-year term of the permit). In the event that the growing season utilization limit was periodically exceeded over the 10-year term of the permit, but less often than the trigger of 2 in any 5-year period, static trend as documented in the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012b) may occur in the short term (1 year or less). However, as long as livestock management practices are implemented to meet the performance-based terms and conditions, native plant communities would improve in health and vigor over the life of the permit.

When livestock management actions under Alternative 3 are considered against the grazing response index suggested by Reed and others (1999), the intensity of grazing use would be low, although the opportunity for frequent re-grazing by livestock during the growing season (more than three times) and limited chance for regrowth following scheduled grazing use combine in 2 of 3 years of the grazing schedule suggest less-harmful impacts to plant health than under Alternative 1 or Alternative 2. The ORMP management objective to improve unsatisfactory vegetation health/condition would be met, with improvement toward less than 10 percent of the allotment in early condition and more than 40 percent in late or potential natural condition. The reduction of stressors to biotic function induced by livestock management practices resulting from the performance-based terms and conditions, primarily limiting growing season utilization levels, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.5.1.2.4 Alternative 4 Effects

The season-based alternative would implement a pasture rotation schedule that includes less frequent use during the critical growth period for pastures 1, 2, 3, and 4, when compared to the other grazing alternatives. In other words, Alternative 4 would implement periodic deferment of grazing use to a period outside the active growing season more often than would occur with implementation of the other grazing alternatives. The decrease in the frequency of growing season use would allow native perennial species to complete the annual growth cycle more often in the absence of livestock grazing, allowing recovery of plant health and vigor. Additionally, Alternative 4 would result in a decrease of active grazing use by 45 percent when compared to Alternative 1. It achieves this decrease in active grazing use by reducing livestock numbers. Whereas livestock management practices identified under Alternative 1 were failing to meet both the Rangeland Health Standard 4 in pasture 4 and the ORMP management objective for vegetation, the combined grazing schedule, with less frequent active growing season use and reduced level of livestock use proposed in Alternative 4, would improve rangeland health to better ensure meeting Standard 4 and the ORMP management objective for vegetation over the long term.

Seasons of grazing use

The season-based alternative provides more frequent deferment of grazing use to a period other than the critical growth period than any other alternative. The grazing schedule would implement a rotation through pastures 3, 4, 5, and 6 that would limit grazing use to 1 in 3 years during the active growing season (May 1 to July 1). Similarly, the grazing schedule would implement annual early spring grazing use of pastures 1 and 2, a period before the active growing season. As identified in Appendix M, active growing season use has a greater potential to impact health and vigor of bunchgrass species as compared to use during periods outside the active growing season. The pasture rotation would result in palatable bunchgrass species, primarily bluebunch wheatgrass, more often being allowed to complete the annual growth cycle in the absence of livestock grazing. The reduced occurrence of partial defoliation by livestock allows plants to continue their growth cycle without the allocation of photosynthate to replace grazed leaf material or to replace grazed tillers midway through the growing season. The ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be improved in years with limited soil moisture.

The grazing schedule for pastures 1 and 2, used annually only at turnout and with grazing use ending prior to April 15, would allow perennial species to regrow following grazing and complete their annual growth cycle, utilizing soil moisture that remains after grazing use. The 3-year deferred-rotation grazing schedule, with use of each of the other four pastures of the allotment occurring in no more than 1 of 3 years during the active growing season, would provide the opportunity for recovery of health and vigor of perennial bunchgrass species consistent with recommendations by a number of sources (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012).

Flexibility to use pasture 5 concurrent with the pasture 6 or the other two pastures used in the 3-year deferred rotation schedule would continue to provide opportunity for recovery following growing season use and not confine grazing use to a period when this poorly watered pasture is the only location available for use during a portion of the grazing season.

Intensity of grazing use

As a result of implementing restrictions to seasons of grazing use for pastures based on resources present within each pasture, Alternative 4 would result in a decrease of active grazing use by 45 percent when compared to Alternative 1. This reduction is largely the product of the seasons of use appropriate for meeting upland vegetation and special status species habitat objectives. This alternative would include stocking individual pastures at a rate no greater than 10.0 acres per AUM when calculated for the limited number of pastures available during the active growing season in any year. Ten acres per AUM is a pasture-specific stocking rate that would be supported by the level of forage production from the early to mid-ecological condition and with consideration for portions of each pasture that are less accessible for livestock grazing due to distance from water and topography. The lightest pasture-specific stocking rate would be 21.1 acres per AUM. Flexibility provided in the grazing schedule after July 1 annually would provide opportunity to adjust scheduled pasture use to climatic conditions and other factors, while retaining at least 10 acres per AUM. As a result, the ecological condition of native upland vegetation communities would be expected to improve due to the proposed decreased stocking rate and resulting light utilization levels in most years and in most pastures as compared to Alternative 1.

Reduced utilization within most pastures of the allotment, as described above, as well as the overall reduction in livestock numbers and authorized active use, would result in improved health and vigor of native perennial species compared to Alternative 1. When combined with the seasons of grazing use that are more appropriate for maintaining and improving biotic health of plant communities in the sagebrush steppe vegetation communities (described above), Alternative 4 would result in greater opportunity for improved health and vigor of native perennial species as compared to Alternative 1 and Alternative 2. The opportunity to maintain or improve health and vigor of native perennial species would be similar to Alternative 3.

The ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species in the absence of periodic natural fire would be improved in years with limited soil moisture.

Weeds

The grazing schedule in Alternative 4 will contribute to the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions, as identified in Alternative 1. With livestock numbers reduced by 45 percent, that risk is proportionally reduced due to less soil surface disturbance and fewer animals that could carry seed to and from the allotment in fur, on hooves, and in their digestive system.

Conclusion

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use to meet resource objectives and with its reduction in livestock grazing use would result in improved native perennial plant health and vigor. When livestock management actions under Alternative 4 are considered against the grazing response index suggested by Reed and others (1999), the likelihood for frequent livestock grazing during the growing season (more than three times) and little or no chance for regrowth following scheduled grazing use would be limited to 1 in 3 years, whereas the utilization level during the growing season would be light during that 1 year. This would result in the benefits to vegetation resources from livestock management practices being similar to actions under Alternative 3 and the least harmful to plant health of the grazing alternatives considered. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. Significant progress would be made toward meeting the Idaho rangeland health standard for native plant communities in pasture 4. Similarly, the Idaho rangeland health standard for native plant communities and ORMP vegetation management objectives in the remainder of the allotment would be met, or where not met, would not be due to current livestock management practices. The reduction of stressors to biotic function induced by livestock management practices, primarily limiting the frequency of growing season use and reducing livestock numbers, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.5.1.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would provide a rate of recovery toward ecological site potential more rapid than other alternatives considered. In the absence of livestock grazing, growing season removal of photosynthetic material of native perennial species, including bunchgrass species that provide the majority of current forage for livestock grazing use, would be limited to use by native herbivores, including insects. Limited growing season removal of plant leaves and tillers would allow bunchgrass species to complete their growth cycle annually without the need to allocate photosynthate to replace grazed leaf material or to replace grazed tillers midway through the growing season, and thus regain health and vigor. Although restoration of vegetation communities consistent with the reference site described in ecological site descriptions is limited to a process which may take multiple decades, if not centuries, recovery would be initiated through the passive action of removing livestock grazing impacts. The degree to which state-and-transition models apply and transitions have been passed will limit opportunity for recovery toward the reference site described in the absence of active vegetation manipulation. The introduction of non-native and invasive species, fire suppression activities, and sources of disturbance, other than livestock grazing and physical impacts from livestock that did not define the reference site, would continue, preventing full recovery even in the long term (decades, if not centuries).

Weeds

The no-grazing alternative eliminates the risk of introducing noxious weeds and invasive species to public lands resulting from soils disturbance by livestock activity and the increased spread of existing incursions resulting from seed distribution in fur, on hooves, and in the livestock digestive system. A number of other vectors for seed dispersal and soil disturbance would continue to provide the need for weed control programs coordinated by and with multiple entities.

Conclusion

The Idaho Rangeland Health Standard for native plant communities would be met in most portions of the allotment, including in pasture 4, with implementation of the no-grazing alternative. Where standard 4 would not be met, current livestock management practices would not be a causal factor. Progress toward a full complement of native perennial species more consistent with ecological site potential would result in the long term, equal to or greater than the 10-year term that livestock grazing would be eliminated, pending additional evaluation. Recovery of ecological site potential vegetation communities would not occur within the 10-year period of initial livestock exclusion because recovery of all vegetation functional-structural groups from the existing ecological condition in sagebrush steppe type occurs at a slower rate, requiring at least decades, if not centuries. Implementation of the no-grazing alternative would allow progress toward meeting the ORMP vegetation management objective. The elimination of stressors to biotic function induced by livestock management practices would allow recovery limited by stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.5.1.3 Cumulative Effects

Cumulative impacts analysis area

The cumulative impacts analysis area (CIAA) for vegetation was set to the Garat allotment boundary (MAP CMLV-1). BLM selected this CIAA because the direct and indirect effects of the alternative Garat grazing schemes will not extend to vegetation beyond the allotment boundaries. In other words, vegetation outside of the allotment will not be meaningfully or materially impacted by the grazing management considered within the allotment. It is further worth noting that plants rooted in the soil are not transient over long distances, with the small exception of the potential for wind to distribute seeds.

Past, present, and reasonably foreseeable future actions

The temporal frame for cumulative impacts to vegetation resources is defined by the continued presence of the effects of past actions and the anticipated longevity of reasonably foreseeable future actions. Past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts analysis were calculated using BLM GIS data and are presented in Table VEG-11. The data used represent the best available information and the calculations based on the data are approximate.

Table VEG-11: Past, present, and foreseeable actions within the Garat allotment CIAA for vegetation

Type of Activity	Past and Present	Reasonably foreseeable additions
Rangeland water developments: Reservoirs Developed springs	76 2	0 0
Wildfire	1973-South Owyhee 1984-Horse Basin 1985-45 Ranch 1985-Horse Basin 1985-Garat 1 1985-Garat 2 1986-Juniper 1996-Juniper 54,082 acres (between 1970-2012)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	6,169 acre prescribed fire – 1981 1,106 acre prescribed fire - 1983	none
Noxious Weed Presence	10 documented infestations	Fewer than 4 acres/year new weed infestation anticipated
Roads	223 miles unsurfaced routes 26 miles surfaced roads	None

Rangeland projects have been constructed in Garat allotment to meet a number of objectives, many to facilitate livestock management. Livestock management projects that may have a long-term residual effect on vegetation include reservoir construction and spring development, which are designed to provide livestock water. The residual effects of surface disturbance from construction or extensive maintenance of each is limited to no more than a decade, while indirect impacts to vegetation resulting from livestock concentration at watering sources are renewed annually. Livestock concentration reduces and removes native perennial grass, forb and shrub species adjacent to each water source. With a radius of less than 1/8-mile of impact to vegetation resources around each water development, the 78 water developments identified in Table VEG-11 would result in 2,652 acres of public land that is annually impacted by livestock concentration adjacent to developed water and would not improve toward reference site conditions with continued livestock grazing authorization.

Although allotment division and pasture division fence construction to date originally altered vegetation resources, residual impacts to vegetation from construction have diminished since construction. Annual livestock trailing adjacent to some sections of fence continues in localized areas, without quantified impacts to vegetation resources.

Wildfire is a natural disturbance factor that is recognized in the natural variability of described reference site conditions for sagebrush/bunchgrass ecological sites. The largest impact from wildfire to native sagebrush-steppe vegetation communities is the short-term removal or reduction in the presence of sagebrush. Paysen and others (USDA USFS, 2000) identified an interval of 30 years or more for sagebrush recovery after fire under pre-1900 succession. Altered fire return intervals, with changes to human-ignited fires, suppression actions, and the introduction of annual species, have resulted since settlement. Vegetation change in the Garat allotment that has resulted from the eight fires documented since 1970, totaling 54,082 acres (some areas have burned more than once during this period) (Map

FIRE-2), has resulted in the natural variability of the reference site. The location and acreage where indirect impacts have led to declining plant community health and condition due to altered fire return intervals, combined short-term impacts from livestock grazing following wildfire (fewer than 5 years), and the dominance of annual species cannot be quantified. As a result, the cumulative impacts of wildfire on the vegetation conditions in the CIAA is both beneficial, leading toward conditions within the natural variability of the reference site, and indirectly adverse, leading toward residual impacts that often have resulted in declining plant and vegetation community health and vigor.

Records of past vegetation treatments that have residual impacts to vegetation resources are limited to two prescribed fires of 6,169 and 1,106 acres, respectively. Prescribed fire and subsequent exclusion of livestock grazing during a period of recovery from fire impacts resulted in the improvement of native perennial plant health and vigor within the project areas.

Actions to control the introduction and expansion of noxious weeds within the CIAA are ongoing, as noted in the Affected Environment section (Section 3.5.1.1). Treatments are limited in size and result in the improved health and vigor of native perennial vegetation communities.

Twenty-six miles of surfaced roads and 223 miles of unsurfaced routes within the CIAA, with an average 16-foot width for surfaced roads and 8-foot width for unsurfaced routes of ongoing surface disturbance from vehicular traffic, result in 266 acres where vegetation resources are held in poor condition.

In combination, past, present and reasonably foreseeable future actions that have led toward improving vegetation health and conditions include wildfire consistent with the natural fire return interval, prescribed fire on 7,275 acres, and ongoing control of noxious weeds on approximately 4 acres annually. Actions that have led toward declining vegetation health and vigor include the indirect effects to approximately 2,652 acres of concentrated livestock activity adjacent to water development projects, wildfire at intervals inconsistent with natural return intervals, the combined impacts to vegetation from wildfire and livestock grazing immediately following fire, and the ongoing disturbance to approximately 266 acres of roads and unsurfaced vehicular routes. The residual effects of livestock management practices through the last few decades of the 1800s and the first few decades of the 1900s, as moderated through the remainder of the 1900s, define sagebrush steppe vegetation communities lacking the full expression of co-dominance by sagebrush species and deep rooted native perennial bunchgrass species (see Table VEGE-8). Past, present and reasonably foreseeable future actions identified above and influencing localized vegetation conditions are secondary to the direct and indirect influences of historic grazing practices on current vegetation conditions. As a result, the ORMP vegetation management objective to improve unsatisfactory and maintain satisfactory vegetation health/condition defines the cumulative effects threshold to limit downward trend away from the native perennial vegetation composition defined in the reference site of ecological site descriptions.

3.5.1.3.1 Alternative 1 Effects

Under Alternative 1, Standard 4 would not be met due to current livestock management practices and the ORMP management objective to improve unsatisfactory vegetation health/condition would not be met. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would not result. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, downward trend in the vegetation condition within the Garat allotment would not meet ORMP vegetation management objectives. The threshold for unacceptable change in vegetation condition would be exceeded.

3.5.1.3.2 Alternative 2 Effects

Alternative 2 would not allow improvement in pasture 4 or progress toward meeting Standard 4. Although the Idaho rangeland health standard for native plant communities may continue to be met in remaining portions of the allotment with implementation of the applicant's proposed action, and the condition of vegetation communities may be maintained, progress toward a full complement of native perennial species consistent with ecological site potential would not result. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, static to downward trend in the vegetation condition and health within the Garat allotment would not meet ORMP vegetation management objectives or the Idaho Standard 4 for rangeland health. The threshold for unacceptable change in vegetation condition would be exceeded.

3.5.1.3.3 Alternative 3 Effects

Under Alternative 3, the Idaho Rangeland Health Standards for native plant communities would be met over the 10-year term of the grazing permit, including in pasture 4 where the standard was not met due to current livestock management practices. The condition of pastures 1, 2, 3, and 4, with limitations to utilization during the active growing season, would improve and lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Garat allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health-native plant communities. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.5.1.3.4 Alternative 4 Effects

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use to meet resource objectives and with its reduction in livestock grazing use, would result in improved native perennial plant health and vigor. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit and Standard 4 would be met. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Garat allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.5.1.3.5 Alternative 5 Effects

Under the no-grazing alternative, the Idaho rangeland health standard for native plant communities would be met, including in pasture 4. Progress toward a full complement of native perennial species more consistent with ecological site potential would result. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Garat allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.5.2 Soils

3.5.2.1 Affected Environment

Geology, Parent Material, and Soils

The Garat allotment is located within the Upper Owyhee and South Fork Owyhee sub-basin. Elevation within its boundaries ranges from 4,600 feet near the Owyhee River Canyon adjacent to Piute Creek to over 5,500 feet on plateau summits near the Duck Valley Indian Reservation. Soils can be separated using two major physiographic regions: the Terraces and Bottomlands (within pasture 6 and pasture 5), and the undulating plateaus, structural benches, and foothills that exist within the remaining pastures. The upland plateaus are primarily basalt in origin while most of the other landform features are developed in welded rhyolitic tuffs and some breccia. The bottomlands and basins consist of sedimentary material and alluvial fills.

There are 19 different soil map units within the Garat allotment representing a wide variety of inherent characteristics that influence vegetative growth, erosion potential, site productivity, drainage class, available water supply, and more. Soils within the analysis area have been mapped and are described in the Owyhee County Soil Survey (USDA NRCS, 2003b), which delineates soil map units, landforms, vegetation components, and provides interpretive information on soil use and management. These soils are tied to ecological sites (Map ECOL-2), which are developed based on environmental factors such as vegetation, soils, and hydrology (Appendix M – Soils and Rangeland Vegetation).

Soil and hydrologic function are critical parameters for properly functioning upland areas. Garat allotment soils are shallow to moderately deep (with deeper inclusions) and generally have a xeric (arid) soil moisture regime. The majority of the allotment falls within a mesic (moist) soil temperature regime, while the slightly higher southeastern elevations in pasture 6 are frigid (very cold) (USDA NRCS, 2003b). Soils are well-drained but can have slow to very slow infiltration rates when thoroughly wet, especially if they contain a high clay content and shrink-swell potential.

Dominant soil textural classes in the Garat allotment are silt loams but can have coarser surface soil textures, such as stony silt and sandy loams, gravelly silt loam, very stony loam, and others. Clay content is lower (less than 26 percent) across some of the undulating plateaus but increases in portions of pastures 1, 2, and 3, much of pasture 4, and the southeastern-most higher elevations of pasture 6, all of which contain high (31 to 35 percent) to very high (36 to 54 percent) levels of clay within the upper 24 inches of soils.

The majority of soils are associated with Loamy 10-13” ecological sites and areas of Shallow-Claypan 12-16” ecological sites that are dispersed through the allotment (Map ECOL-2). Loamy 10-13” ecological sites occur where soils are moderately deep and where a mesic soil temperature regime is present (generally sites below 5,400 feet elevation). Shallow Claypan 12-16” ecological sites can be found where soils are shallow to bedrock or have heavy clay layers in the profile.

Based on inherent soil characteristics, the erosion hazard from water is rated slight (91 percent), with the exception of slopes greater than 30 percent, where the erosion hazard is rated severe (8 percent). In general, soils within the allotment area are stable, with little to no erosion, especially where surface rock fragments provide cover and greatly modify runoff potential and sediment movement. Slopes range between 0 and 30 percent across the allotment but can exceed 30 percent below plateau rims around the basins and along scattered steeper slopes. Wind erosion hazard is rated low.

Existing Condition

Soils in the Garat allotment are degraded due to departures in watershed function associated with soil surface loss, especially from increased water flow patterns, pedestaling, and bare ground. Moderate departure ratings (Table SOIL-6) are identified for pastures 1, 3, and 6, as well as other localized areas of the Garat allotment, and are especially associated with Loamy 10-13” sites.

Table SOIL-6: Summary of ratings for soil stability and hydrologic function

Allotment & Pasture (#)		Meeting Standard 1 - Watershed	
	Departure Rating	**Yes**	**No**
Garat	**moderate**		**X**
Dry Lake (1)	moderate		x
Piute Creek (2)	slight-to-moderate	x	
45 Field (3)	moderate		x
Kimball (4)	slight-to-moderate	x	
Big Horse Basin (5)	slight-to-moderate	x	
Juniper Basin (6)	moderate		x

Sediment movement may be relatively short and incremental on flat terrain within the allotment but is of greater significance where slopes that are not disrupted by vegetation, gravels, litter, or microbiotic soil crusts promote transport over longer distances. Along the large and relatively gently sloping plateaus of the Garat allotment, the sealing of surface soils is apparent in water flow patterns within plant interspaces and indicates a reduction in stability as soils are transported and deposited during rain events. Erosional processes have greater impacts along steeper slopes that can be found where abrupt rims give way to below-lying basins, such as in the northeast portions of pasture 3, the northern part of pasture 4, eastern half of pasture 5, and through the central part of pasture 6. Slopes average from 0 to more than 15 percent across the plateaus and intermediate slopes but can vary from 20 to more than 50 percent on the breaklands below the rim. Alterations of soils occur due to livestock trampling and hoof action when soils are wet in the spring, particularly affecting pastures 1, 2, 3, and 4.

Ground cover data (Table SOIL-7) exhibit a downward or static trend in basal vegetation, total vegetation, and biological crusts, along with static or increasing canopy cover representing shrubs, increased litter, and a reduction in bare ground. When litter is increasing, as can be expected with the elevated presence of mature sagebrush, bare soils often decline and are masked by abundant material. However, bare ground may increase again over time with plant mortality and decadence, especially in mature sagebrush communities, which is the case in pasture 3 and, at a more reduced rate, in pasture 1. With decreased litter and increased bare ground, the potential detachment of soil particles due to a lack of protective cover can contribute to increased erosion. This can be observed on the RHFA sites.

Table SOIL-7: Summary of ground cover results from trend data (1989 to 2009) in 12 plots of the Garat allotment

Component	Ground Cover – Trend Summary
Bare Ground	Mostly a significant long- and short term decrease; pasture 6 increased
Basal Cover	Mostly a significant long- and short term decrease or static
Non-persistent Litter	Mostly a significant long- and short term increase, some static
Total Vegetation*	Mostly a non-significant short term decrease or static, no long-term available
Canopy Cover*	Mostly a non-significant short term increase or static, no long-term available
Rock/Gravel/Persistent Litter/Biotic Crust	Mostly increase in short-term or static, decrease in long-term

*trend from 2003 to 2009

There have been seven wildfires ranging in size from 2 acres to 24,694 acres in the Garat allotment since the 1960s (Map FIRE-2). A majority of the fires have occurred in pastures 4 and 6 and include portions of adjacent pastures. Pasture 4 recorded the most acreage burned by one fire (14,165 acres) that comprised portions of pastures 2 and 3. The most wildfires (4) have occurred in pasture 6, while the most active fire year in 1985 affected portions of all pastures (except pasture 1), with four fires burning a total of 32,988 acres.

The dominance of annuals and their adverse effects on watershed function contribute to the most notable departure from reference conditions in pasture 6 as a result of past fire. Five of the eight sites that do not meet the standard for exotic plant communities are dominated by annual species and occur within the old fire perimeters. Three ground cover trend sites show predominantly static or decreasing conditions for basal vegetation, microbiotic crusts, non-persistent litter, total vegetation, and canopy cover. Although annuals provide spring forage for livestock and cover for watershed protection by effectively reducing raindrop energy, the presence of annuals indirectly affects the biological, chemical, and physical aspects of soils and long-term rangeland health by altering soil moisture regimes and nutritional cycles.

A network of roads is present in the Garat allotment and provides access to every pasture. However, road conditions are variable and often deteriorate with distance from main routes. The majority of the perimeter along the east, north, and west of the allotment is bound by the Owyhee River, which provides no direct access except at Crutcher's Crossing, Wiley's Ranch, and Garat Crossing during low flow. Soil disturbance from recreation is generally limited to vehicular use, is restricted to existing roads and trails, and has not been an issue.

Factors in Failing Standard 1 - Watershed

The allotment currently fails to meet Standard 1 for Watersheds because historic livestock grazing and artificial fire regimes have negatively affected native vegetation such that their current composition is significantly departed from expected conditions. Where fire has been absent, such as in pastures 1 and 3, shrubs have been competing with native vegetation and dominate, while deep-rooted bunchgrass species are underrepresented. As a result, shrub mortality and decadence at sites that have not burned affect soil dynamics, especially if reduced cover promotes surface soil loss and bare ground. Besides competition between sagebrush and herbaceous cover in the absence of fire, historic grazing management has added to the reduction of the native understory of vegetation communities.

Where historic livestock grazing management did not provide opportunity for recovery of vegetation immediately following past fires, localized areas are degraded and many sites that burned in the mid-1980s have not recovered. This is apparent in pastures 4 and 6, where soil and hydrologic function are impaired due to a lack of plant diversity, a reduced shrub component, and a departure from ecological site potential in the structural functional groups, along with dominance of annual and small perennial grasses.

In both pastures, the presence and the lack of fire, along with historic grazing, has reduced desirable deep-rooted bunchgrasses that stabilize soils, contribute valuable litter, and promote infiltration. Native bunchgrasses and forbs increase soil surface resistance to erosion by providing ground cover that reduces bare ground, slows the velocity of water flow, and lessens the potential for soil surface loss. Degraded watershed function from changes in biotic integrity are therefore apparent in water flow patterns, pedestals, and bare ground that show departures from reference conditions, especially when associated with Loamy 10-13" ecological sites. Since 52 percent of the Garat allotment consists of Loamy 10-13" sites, a large portion of the allotment appears to be more susceptible to impact than the remaining half.

Even though current livestock grazing was not identified as a significant factor for not meeting Standard 1, it still has localized effects on soils. Heavy livestock use surrounding Juniper Reservoir and Piute Reservoir, water developments, travel routes between water sources, and salting areas result in localized compaction, increased bare ground, and heavily impacted vegetation. Proposed grazing management changes reflected in the proposed alternatives (analyzed below) that promote improvements to vegetation and biotic integrity would be beneficial to soil stability and hydrologic function.

The 2012 Garat RHA and Evaluation Report (USDI BLM, 2012b) and Determination (Appendix J) identify that most of the sagebrush steppe vegetation communities currently present vary from reference site potential, as deep-rooted bunchgrass species are underrepresented. With a decrease in desirable native vegetative cover, runoff and erosion become more common and adversely impact watershed function and soil nutrient cycling. The departures from ecological site potential (USDA NRCS, 2010) suggest little current indication of improvement from static or declining existing conditions and result in a moderate rating of soil/site stability and hydrologic function that is not meeting Standard 1.

3.5.2.2 Direct and Indirect Effects

Analyses of Alternative 1 and action alternatives 2 through 5 are based on consequences of seasons and intensities of livestock grazing use on soils provided in Appendix M - Soils and the soil affected environment section for the Garat allotment above. These sections provide ecological, physical, and biological concepts for expected soil impacts resulting from livestock management practices. A detailed discussion on rangeland vegetation inventory and ecology and the state-and-transition model can be found in Appendix M – Rangeland Vegetation as it is tightly connected to upland soils. More site-specific information for the Garat allotment is also available in the Rangeland Vegetation Section 3.5.1. For a continuation of processes involving upland soils and sediments and their effects on water resources, riparian areas, and wetlands, refer to Section 3.5.4.

3.5.2.2.1 Alternative 1 Effects

Alternative 1 would continue to authorize grazing under the same terms and conditions as in the past, although with reduced AUMs (based on recent maximum active use) compared to the current permit (see Section 2.8.2 and Appendix D – Tables 3 and 4). The livestock grazing recent maximum use that has occurred under Alternative 1 serves as the baseline of comparison to the other alternatives.

The Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012b) and Garat Determination (Appendix J) identify that the allotment does not meet the Idaho Standards for Rangeland Health - Standard 1 for upland watersheds. Failing to meet the standard was attributed to historic grazing management practices and fire history, as described previously under existing conditions. As a result, departures from expected conditions in the plant community are occurring because vegetation communities with a full complement of dominant grasses and shrubs consistent with the reference phase of the site potential are not present. Since functioning upland soil and watershed processes for each ecological site are intimately tied to healthy plant communities to provide for soil stability, hydrologic function, and nutrient cycling, the restoration, improvement, and maintenance of native perennial bunchgrasses is of primary interest.

Under Alternative 1, grazing in four pastures would continue to occur during the critical growing season (May 1 to July 1) in the spring and early summer. This would increase the overall potential for sediment movement and adverse effects to watershed health since vegetation vigor, primarily native perennial bunchgrass reproduction and cover essential for soil stability and infiltration, would not improve. These effects would be amplified if flexibility in pasture use is given, as it has been in the past (Appendix B), especially if additional growing season use occurs under the prolonged absence of rest or deferment years.

With livestock use during the active growing season, improvements to soil and hydrologic function would be minimal or decline since rest in less than the planned 1-of- 3-years cycle, as has occurred based on actual use records, may not provide adequate opportunity for recovery of plant health and vigor following repeated years of active growing season use. The ability of desirable perennial bunchgrass species (e.g., bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be reduced.

The continued decline in deep-rooted bunchgrasses would be likely to increase bare ground and would therefore promote increased water flow patterns as patches become larger and connected. The resulting accelerated erosion and movement of sediments lead to surface loss and degradation, changes in infiltration patterns, and loss of persistent litter. This makes it increasingly more difficult for herbaceous cover to regenerate and maintain, so that nutrient cycling, soil stability, and hydrologic function are further altered over the long term (Appendix M - Soils).

Grazing under Alternative 1 would also occur during the spring and early summer season when impacts from hoof action on wet or saturated soils are at their greatest potential to result in soil pugging (plunging hoofs into wet soil, creating a void) and compaction, although range readiness criteria would be applied. Medium- to heavy-textured soils, typically clay, are especially prone to damage during the spring grazing season because they tend to have high moisture-holding capacity, are usually at or near field capacity, or have higher water content due to snow melt. Pastures 2 and 4 are the most susceptible to impacts from grazing, as are the eastern portions of pastures 1 and 3 that are dominated by shallow claypan soils.

Soils have been affected in portions of pastures 2, 4, 5, and 6 where the former sagebrush-steppe plant composition has been altered by past fires and where desirable native vegetation relative to site potential have had difficulty re-establishing. The reduced plant biomass, insufficient residual litter amounts and persistent soil cover, and decreased root structure diversity from shallow bunchgrasses and/or annual invasives would adversely influence infiltration and moisture holding capability, especially when grazing occurs during the critical growing season.

Plants grazed during the critical growing season for native perennial bunchgrasses also experience decreasing soil moisture that does not provide opportunity for regrowth before the dormant period. Pastures 1, 2, 3, and 4 are most affected because of a reduction in seed availability that influences reproduction of deep-rooted native bunchgrass communities with repeated years of active growing season grazing. Potential drought years, though not predictable, would further affect vegetation. The reduced ground cover would promote an increased potential for sediment movement and alter the hydrologic and nutrient cycle over the short and long term.

Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel would provide sites for establishment of weeds and invasive species. Areas of cheatgrass dominance and other invasive annual species were identified in the 2012 Rangeland Health Assessment (USDI BLM, 2012b) and Determination (Appendix J). Livestock grazing is expected to contribute to the spread of weeds and invasive species that adversely affect soil moisture and soil nutrient availability.

Implementation of Alternative 1 would continue to have similar effects on the existing condition described for soils in upland watersheds. Since grazing would occur during the critical growing season with limited rest and/or deferment, and flexibility would be built into the permit to allow for fluctuation in actual use (Appendix B), Alternative 1 would provide little to no improvement to ecological function and site potential because proper nutrient cycling, hydrologic cycling, and energy flow would not be improved. Progress toward enhancing soil and upland watershed resource issues and associated impacts consistent with ecological site potential is not expected to result in or allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.5.2.2.2 Alternative 2 Effects

Alternative 2 would authorize spring and summer grazing among the six pastures in accordance with mandatory and other terms and conditions as outlined in Section 2.8.2. The immediate restoration of voluntary non-use AUMs and the additional incremental increases if objectives are met (Appendix D – Tables 3 and 4) are expected to result in periodic utilization levels that could exceed recommended conservative stocking rates.

When combined with use during the critical growing season, increased utilization levels resulting from the 21 percent increase in stocking rates could negatively impact vegetation vigor, reproduction, and cover, thus elevating the potential for adverse impacts to soil and watershed health, as discussed under Alternative 1. To avoid that, the permittee therefore proposes grazing use adjustment protocols (Section 2.8.2 and Appendix F) that implement the use of short- and long-term monitoring. A 5-year evaluation cycle would be used to identify appropriate increases or decreases in stocking rates and is dependent upon determining whether current livestock management is a contributing factor to meeting or not meeting allotment-specific management objectives for resources. This raises the potential of declining upland soil and hydrologic function until completion of the next 5-year evaluation cycle as soil cover, bare ground, and susceptibility of the area to accelerated erosion could increase as desirable native bunchgrasses are utilized by even greater numbers of livestock.

The Garat allotment grazing strategy submitted by the applicant also offers additional management rest and deferment for pastures during certain years, depending on water availability, that could benefit the plant community and watershed health in a particular pasture at that time. Conversely, the strategy adds potential pressure due to flexible use, as some pastures may take on additional AUMs due to limitations elsewhere, which would result in adverse effects on soils and watershed health as livestock numbers are increased and/or season of use is extended, especially if it involves grazing during the critical growing season. This would be amplified by the immediate restoration of voluntary non-use as active authorized use that would increase cattle by 21 percent. Consequently, soil and hydrologic function are not expected to maintain or improve over time due to increased grazing pressure on the plant community.

Although range readiness criteria is applied, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would increase with elevated stocking rates. This would primarily affect pastures 1, 2, 3, and 4. Because Alternative 2 proposes the greatest increase in stocking rates out of all alternatives, the concentration of soil disturbance, associated risk for weed infestation, and resulting adverse impacts to soil and hydrologic function is deemed the highest.

Plants grazed during the critical growing season for native perennial bunchgrasses also suffer from decreasing soil moisture that does not provide opportunity for regrowth before the dormant period. All pastures could be affected by a periodic reduction in vigor and seed availability that affects reproduction, especially during repeat years of active growing season grazing. Pastures 4 and 6 are most susceptible due to season-long grazing use. Declines in the reproduction capacity of deep-rooted native bunchgrass communities would affect soils by increasing the potential for sediment movement and runoff and would alter the hydrologic and nutrient cycle over the short and long term.

Alternative 2 proposes to initially increase AUMs by 21 percent and potentially long-term by 78 percent in the absence of extended rest or deferment. Balancing stocking rates with forage resources with the help of the proposed applicant’s grazing strategy would provide a tool to monitor upland vegetation communities and associated watershed function. Continued long-term monitoring would be provided by the operator to assess rangeland conditions and determine if specific modifications to seasons or intensities of use or livestock numbers would be applied. However, adjustments would depend on whether current livestock grazing management is a factor in meeting or not meeting standards.

The ongoing need to maintain and improve the native plant community is the foremost contributor to attaining similar benefits to soil and hydrologic function and upland watershed health. This can be done by limiting the frequency of grazing use during the critical growing period, which ultimately affects the stocking rate for each of the pastures within the allotment. The implementation of Alternative 2 provides little improvement and has a greater potential to eventually fail to meet the standards due to current livestock management, since stocking rates would immediately increase, while grazing would continue to be scheduled with minimal rest and deferment. Progress toward enhancing soil and upland watershed resource issues and associated impacts consistent with ecological site potential is not expected to result in or allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.5.2.2.3 Alternative 3 Effects

The main difference between Alternative 3 and Alternative 1 is that Alternative 3 includes performance-based terms and conditions (Section 2.3) that would limit use in specific ways such that native plant communities would see positive improvement in the short and long term (see Section 2.8.2 and Appendix D – Tables 3 and 4).

Alternative 3 would improve existing condition compared to Alternative 1 in part by implementing a performance-based term and condition (Section 2.3) related to upland utilization (see Section 2.8.2 and Appendix D – Tables 3 and 4). Though active use AUMs would increase by 3 percent under this alternative, this would not undermine deep-rooted perennial bunchgrass growth and vigor because their reproductive capability would be maintained by restricting utilization to slight (≤20 percent) levels during the growing season. Maintenance and recovery of bunchgrass communities would promote soil stability and watershed function and provide soil cover, decrease bare ground, and generally reduce the susceptibility of the area to accelerated erosion. Deep-rooted vegetation would increase infiltration, provide litter, and aid hydrologic function and nutrient cycling.

Since functioning upland soil and watershed processes for each ecological site are intimately tied to healthy plant communities, maintenance of native vegetation and cover is of primary interest. Additional performance-based terms and conditions for vegetative stubble height within sagebrush and perennial grassland for sage-grouse upland and riparian lentic areas would therefore also be beneficial for improving and maintaining soil stability and hydrologic function. This would make Alternative 3 more restrictive than the proposed grazing use adjustments in Alternative 2.

Although range readiness criteria would be applied under Alternative 3, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would slightly increase with elevated stocking rates. This primarily affects pastures 2, 3, and 4. While an increase in active use AUMs by 3 percent may not be readily detectable, the concentration of soil disturbance can be deemed higher for Alternative 3, compared to Alternative 1, and increases the risk for weed infestation and adverse impacts on soil stability, moisture retention, and nutrient cycling.

The implementation of Alternative 3 is expected to improve soil and upland watershed health over Alternative 1. Despite an increase of active AUMs by 3 percent and limited rest and/or deferment, the 20 percent upland utilization limit during the growing season, along with additional terms and conditions for riparian and wildlife resources, are in place to improve vegetation. This would reduce grazing pressure on native bunchgrasses and provide improvement to ecological function and site potential. As a result, soil stability, productivity, hydrologic function, nutrient cycling, and energy flow would be positively affected over the short and long term and would allow for an upward trend over the life of the permit.

3.5.2.2.4 Alternative 4 Effects

The implementation of increased rest during the critical growing season and seasonal restrictions is expected to increase and maintain vegetative vigor of native perennial bunchgrasses. This would positively affect soils because improved upland vegetation communities would provide added soil stability and hydrologic function. Since deferment during the active critical growing season is used in 2 out of 3 years, vegetative vigor of native perennial bunchgrasses would be maintained or increased and would provide for an increased opportunity to positively impact soil and watershed health. Pastures 1 and

2 benefit the most because grazing would end after a 1-month period early in the critical growing season every year and provide opportunity for regrowth before the dormant period.

The restricted seasons and the resulting decrease in active use AUMs by 45 percent (see Section 2.8.2 and Appendix D – Tables 5 and 6), compared to Alternative 1, would reduce utilization levels. This would provide upland vegetation communities with opportunity to improve and result in increased soil cover, decreased bare ground, and reduced susceptibility of the area to accelerated erosion. The overall allotment-wide reduction in cattle numbers would benefit soil and watershed health by decreasing grazing pressure on plant communities and would promote soil stability, litter, and nutrients. In addition, flexibility to use two concurrent pastures due to climatic conditions and water availability while retaining no less than 10 acres/AUM would reduce grazing pressure.

Although range readiness criteria would apply under Alternative 4, the spring and early summer grazing that also occurs under the alternative would increase the potential of impacts from hoof action on wet or saturated soils as described under Alternative 1. Pastures 1 and 2 are most susceptible, while pastures 3, 4, 5, and 6 would benefit by only being affected once every 3 years due to deferment. This would provide for opportunity to promote plant vigor and reduce impacts from soil pugging and compaction during the wetter season compared to Alternative 1.

While the risk of spreading noxious weeds and invasive species remains, the concentration of soil disturbance and adverse impacts on soil stability and nutrient cycling is expected to be lower for Alternative 4 because of decreased active use AUMs by 45 percent.

Alternative 4 would make progress toward desired conditions because the incorporation of rest and deferment from the critical growth period, along with reduced livestock numbers, would promote an increase in upland plant growth, vigor, and cover compared to Alternative 1. Although no rest is used and the number of days in each pasture during most of the rotation years are close to or greater than Alternative 1, the reduction of maximum actual use by 45 percent would minimize the stocking rate/critical growth period use effects, improve upland vegetation communities, and result in decreased adverse impacts to soils.

The implementation of the season-based Alternative 4 is expected to improve soil and upland watershed health over Alternative 1. With conservative or no grazing occurring during the critical growing season, Alternative 4 allows for proper nutrient cycling, hydrologic cycling, and energy flow and provides an opportunity to enhance ecological function and site potential. Improvement in soil and upland watershed resource issues and associated impacts consistent with ecological site potential would allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.5.2.2.5 Alternative 5 Effects

Alternative 5 would eliminate all grazing in the Garat allotment for 10 years and make the most significant progress toward desired conditions because soil impacts would decline and only be affected by recreational grazing (i.e., from equestrian use) and wildlife. This alternative would provide for the most unimpeded and rapid improvement of soils affected by livestock grazing but would not eliminate soil impacts resulting from other uses.

Sites that are currently impacted from grazing would move toward desired conditions of improved soil quality, increased water infiltration, and vegetative cover. Site productivity would increase and mechanical damage to the soil surface from livestock hoof action would cease. Extended rest from livestock grazing would enhance perennial plant vigor and production, along with subsequent reproduction and establishment. The increased canopy cover, surface litter, above-ground structural material, and fibrous root matter would aid in protecting the soil from both wind and water erosion. However, increased surface fuels may elevate the potential for higher soil burn severities in the event of a fire.

Soil conditions have the potential to improve over time, although recovery would depend on soil and site characteristics and climate and may not be evident in all locations. Natural processes of recovery would be achieved through cycles of wetting and drying, shrinking and swelling, freeze and thaw, root growth, and bioturbation of compacted layers, and would provide additional soil organic matter. Increases in residual vegetation, energy flow and nutrient cycling, ground cover, and soil stability would improve over the long term. Eliminating livestock disturbance would reduce the risk of weed infestation and its associated adverse impacts on soil stability and nutrient cycling though other vectors for seed dispersal remain and would continue the need for weed control programs coordinated by multiple entities.

The implementation of Alternative 5 is expected to maintain or improve soil and upland watershed health over the existing condition. The allotment would make significant progress toward meeting Rangeland Health Standard 1 and ORMP objectives because proper nutrient cycling, hydrologic cycling, energy flow, and soil and hydrologic function would be maintained or allow for an upward trend over the life of the permit and positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.5.2.3 Cumulative Effects

Analysis Area and Temporal Timeframe

Soil and watershed standards and objectives are applied to activity areas, which are the individual pastures within the allotment. The allotment is considered an appropriate geographic unit for assessing direct and indirect soil environmental effects because soil productivity is a site-specific attribute of the land and is not dependent on the productivity of an adjacent area. Similarly, if one acre of land receives incremental soil impacts – i.e., reduced soil porosity, water holding capacity, aeration, long-term productivity etc. – and a second management activity is planned for that same site, then soil cumulative effects are possible.

The cumulative impacts analysis area (CIAA) for upland soils was set to the boundary of the Garat allotment. The CIAA was selected because the direct and indirect effects of grazing management on upland soils, as well as hydrologic function and energy flow, can be detected within the allotment boundary. Outside of this area, however, direct and indirect effects of the grazing scheme will be so small as to not create identifiable cumulative effects. At greater distances from the allotment, it becomes even more difficult to determine any impacts due the dilution effect that comes with the increased acreage.

However, through erosional and depositional processes, upland soils provide for the sediment sources that enter riparian areas and are transported within stream systems throughout the watershed and beyond. While the watershed level could be considered to serve as the CIAA for upland soils, soil and hydrologic function is site-specific. To the extent that soil movement in stream channels affects resources outside of the allotment, the direct/indirect effects and cumulative effects are considered in detail in the Water Resources Section 3.5.4.

While it is possible that cumulative impacts from sediment movement pass beyond a fence line onto a neighboring allotment or area, the primary consequence would be its impacts on streams and water quality, which is covered by Water Resources. Since wind erosion hazard is rated low for the allotment and beyond (USDA NRCS 2003), the analysis area will not expand beyond the allotment boundary.

Similarly, mass failures are also a non-issue, especially since the proposed actions do not include any road construction, juniper treatment, or prescribed burns.

Based on available research and current technology, the Idaho Standards for Rangeland Health (Appendix A), ground cover trend (USDI BLM, 2012b), and the ORMP (USDI BLM, 1999a) were used as a basis for setting thresholds for measurable or observable soil properties or conditions. The threshold values, along with areal extent limits, serve as an early warning signal of reduced soil and hydrologic function. Significant changes in soil productivity of the land are indicated by changes in soil properties that are expected to result in a reduced productive capacity over the planning horizon. Likewise, declining conditions for rangeland vegetation consistent with ecological site potential contribute to deteriorating soil and hydrologic function. Vegetation therefore becomes the primary indicator that determines upland watershed health.

Additionally, in Appendix M - Soils, influences on soils from humans, general grazing, season of use, and stocking rates are discussed in greater detail. The intent is to provide an overview of commonly observed impacts, trends, and potential consequences associated with range management. These impacts are relevant to all alternatives and provide the background for the comparison of effects.

Analysis timeframes for cumulative effects include past and present activities that have created the present conditions, and reasonably foreseeable future activities planned within the next 3 years, including the expected duration of effects from current and future activities. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within 3 years. For this evaluation, short-term effects are those that occur approximately within the first 10 years following permit renewal, long-term effects are those that expand 10 years or beyond.

Existing Conditions

As noted above, the CIAA for upland soils in the Garat allotment is the allotment boundary. This area includes portions of the Juniper Creek, Piute Creek, Red Canyon/Owyhee River, Yatahoney/Owyhee River, and Coyote Springs/SF Owyhee watersheds and encompasses a total of 211,667 acres (Table SOIL-8). Based on inherent soil characteristics, the erosion hazard from water is rated slight (91 percent) to moderate (1 percent), with the exception of slopes greater than 30 percent where erosion hazard is rated severe (8 percent).

Table SOIL-8: Watersheds that encompass the Garat allotment

5th Field HUC	**Watershed Acres**
Juniper Creek	42,736
Piute Creek	45,927
Red Canyon-Owyhee River	18,731
Yatahoney Creek- Owyhee River	14,450
Coyote Springs-SF Owyhee	89,822
Total	**211,667**

Past, present, and reasonably foreseeable future activities within the analysis area (the Garat allotment) relevant to cumulative effects were calculated using approximated BLM GIS data and are displayed in Table SOIL-9. The soils and upland watershed cumulative effects analysis area coincides with the direct and indirect analysis area for which existing conditions are described in Section 3.5.2.1.

Table SOIL-9: Past, present, and foreseeable actions within the Garat allotment cumulative effects analysis area

Type of Activity	Past and Present	Reasonably Foreseeable Future
Grazing AUMs	Max. 18,876 AUMs (in 1999)*	Permit to be processed by 2013
Wildfire	55,702 acres (1973-2011)**	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	7,275 acres (1981-1983)[#]	None
Noxious Weed Presence	10 infestations	Fewer than 10 acres/year of treatment anticipated
Roads (all are unpaved)	248 miles	None

Past records extend to *1986; **1960; [#]earliest record

Over the past decades, livestock grazing has been the dominant land use activity in the area. Wildfires have caused localized disturbances, while wildlife grazing, prescribed fire management, and recreation have had limited effects due to their localized and small areal extent. An additional influence on the CIAA has been current and past fire and fire suppression activities. As a result, the CIAA has been altered from what would be expected under a natural disturbance regime, mainly due to an increase in sagebrush in localized areas (see Rangeland Vegetation Section 3.5.1 and Appendix M). The allotment has been primarily grazed throughout the spring and summer and a variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs, have been implemented across the landscape to aid in livestock grazing management.

The movement of upland sediment across the landscape is initiated in the form of erosion and, over time, reaches a water source that allows for further transport. Erosion rate, amount, and magnitude are dependent on slope, topography, climatic events, parent material, soil characteristics, vegetation, and potential localized impacts. As previously mentioned, the majority of erosion potential within the CIAA is slight. The greatest cumulative effects occur where uplands encounter non-functioning degraded riparian areas, especially perennial streams that are not meeting water quality standards (Water Resources Section 3.5.4).

However, grazing management on BLM-administered lands is periodically changing in order to meet standards, which have been in place since 1997 to assess grazing activities and their impacts on resources. These periodic management changes to meet standards eventually improve overall resource conditions or make significant progress toward meeting standards. Additionally, the recent designation of the North Fork of the Owyhee River as a Wild and Scenic River, along with wilderness designation, should improve conditions in these areas by limiting specific land use activities.

Past, Ongoing, and Reasonably Foreseeable Activities

Livestock Grazing: Less-restrictive grazing use during the turn of the century and into the early parts of the last century has resulted in historical resource impacts that span from physical soil impacts due to high livestock numbers to increased erosion from alterations in vegetation. Restrictions and management guidelines have been implemented over the past decades and have contributed to improved upland soil and vegetative conditions. Livestock grazing within the CIAA continues to be the dominant land use activity and occurs primarily throughout the spring and summer. The pressures from grazing have physical, biological, and chemical effects to soils (Appendix M – Soils) that vary based on differences in season of use, stocking rate, and length of use.

Wildfires and Fire Suppression: Wildfires have burned approximately 55,702 acres (26 percent) between 1973 and 1996 and have mostly affected the CIAA during the mid-1980s (Map FIRE-2; Tables SOIL-9 and 10). Consequent resource damage from mechanized suppression activities and burn severity have caused short-duration disturbances to soils that range from negligible to severe, depending on location, size, and severity of burn. When wildfires have burned across upland soils, the compounding impacts from temporary loss of infiltration capacity, overland flow, and increased soil erosion, have occurred in localized areas but generally decrease or vanish over 1 to 6 years (DeBano, 1981) (Dyrness, 1976) (Huffman, MacDonald, & Stednick, 2001). The change in vegetation, however, can be long long-term.

Primary risks from fires in the foreseeable future are associated with upland erosion from steep slopes, breaklands associated with basalt or rhyolite rims above basins, and roads, especially at stream crossings (Water Resources Section 3.5.4). Loss of soil productivity could be extended, depending on burn severity, location, and post-fire climate characteristics, especially if invasive annuals establish and further alter the plant community. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery could occur and reduce potential negative effects. Grazing may also be suspended to allow vegetation to recover and would reduce additional impacts to soils.

Past and current fire suppression has also influenced fire frequency that has contributed to the increase of sagebrush across the landscape. Sagebrush/bunchgrass communities have been altered by exhibiting a reduced dominance of deep-rooted bunchgrasses and a corresponding increase in shallow-rooted grasses and/or invasive annuals. The continual incremental effects of fire absence would contribute to a cumulative increase in upland erosion over the long term but can change with the probability of future wildfires.

Vegetation Treatments: Vegetation treatments, such as prescribed fires and sagebrush control, have had limited effects on the watersheds due to their localized and small extent (Tables SOIL-9 and 10). In the early 1980s, 7,275 acres of prescribed fire were used to treat vegetation. Though no prescribed fires are scheduled for the reasonably foreseeable future, vegetation treatments at a later point are likely to continue and would have short-term localized impacts on upland soils but would benefit watershed health over the long term.

Weed Treatments: There are about 10 documentations for exotic weed infestations in the analysis area (Tables SOIL-9 and 10). Disturbed soils, for example around salting areas or water developments, provide an optimal location for weed establishment and subsequent invasion and have the potential to increase localized erosion, deplete soil moisture, and alter nutrient levels. Fewer than 10 acres per year of the currently few and limited weed infestations are anticipated to be treated. Activities associated with the small areas impacted by weed treatments would have no effect on upland soils and watershed health.

Roads: The construction of roads on public lands has resulted in the removal of soils from the productive land base on approximately 248 miles of roads that traverse the analysis area (Tables SOIL-9 and 10). Depending on location, the amount of traffic that occurs on a given road, and road conditions, movement of soils occurs and allows for sediment transport over various distances at a local or broad-scale level, adding to localized accelerated erosion across the analysis area but cumulatively covering a small percentage of the CIAA.

Road Maintenance: Additional soil impacts from proposed road maintenance activities such as grading, drainage improvements, and surfacing on existing dedicated roads will be ongoing and would produce localized soil disturbance associated with the use of heavy equipment. Some roads will receive little to no maintenance, especially if restricted or gated.

Recreation, OHV Use, and Other Activities: The analysis area is open for general motorized use that allows for hunting, fuel-wood gathering, collection of miscellaneous products, camping, and motorized touring on established roads. Recreation has had localized resource effects by exposing or compacting soil from driving, dispersed camping, or by impacting vegetation. Those areas that are frequented by recreationists are disturbed where soils and associated vegetation are permanently or semi-permanently altered from heavy use. Off-highway vehicle (OHV) use does occur in some areas and will continue to have localized impacts on upland soils, especially when it involves unauthorized cross-country trails. Cumulatively, these trails are of no issue in the Garat CIAA.

However, with the increase in population in the Treasure Valley and the surge in off-highway vehicle (OHV) use, current and future pressures on upland soils are expected to increase, especially if vehicular use and recreation expands beyond existing roads and trails. The Owyhee Scenic Byway (Mud Flat Road) is the most accessible recreational route in southern Owyhee County and provides access to areas located north of the Owyhee River at Crutcher's Crossing, Wiley's Ranch, and Garat Crossing, providing access to the CIAA during low flow. Recreation south of the Owyhee River is generally limited, with most of the access occurring across the Duck Valley Indian Reservation originating from Highway 51.

A transportation plan for Owyhee County is expected in the near future and may alleviate some concerns associated with OHV use because routes would be designated, reducing cross country and unauthorized travel. However, products resulting from travel management, such as maps and signage, are likely to result in greater visitor use, which may increase pressure on upland soils and watershed resources. The recent Wilderness and Wild and Scenic River designation along the Owyhee River is also expected to increase recreation use of this general area.

Table SOIL-10: Garat allotment CIAA – summary of effects on soils

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Livestock Grazing	Ongoing, continuous	Maximum 18,876 AUMs	Across entire analysis area	Moderate	Physical impacts to soils; upland watershed health changes due to shift in less desirable veg species composition
Fences	Most constructed before 1980; few additions each decade	About 236 miles of fence	Distributed across analysis area, but cumulatively covering a small percentage of area	Low	Short-term, localized construction and maintenance disturbance; chronic cattle trails compact soils
Water Developments	Most constructed before 1980; few additions each decade	Minimum of 94	Distributed across analysis area, but cumulatively covering a small percentage of area	Low to moderate	Short-term, localized construction and maintenance disturbance; chronic cattle congregation trampling soils
Prescribed Burning	Mostly in 1980s	Estimated about 7,275 acres	Patchy within analysis area	Moderately high within burn area; low across entire area	Shift to grass/forb/shrub community increases soil stability, hydrologic function, and improves nutrient flow; potential weed increase
Fire Suppression	Ongoing, continuous	Moderately effective given distance to fire facilities, etc.	Across entire analysis area	Moderate	Pros: maintains stabilizing ground cover on soils; Cons: long-term shift from grass/forb/shrub community to mostly shrub dominated areas with reduced

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
					watershed function
Roads	Nearly all in place before 1980	About 248 miles of roads and routes total	Distributed across analysis area, but cumulatively covering a small percentage of area	High but localized; overall moderately low	Vegetation community shift results in increased bare soils, decreased soil stability, hydrologic function, and reduced nutrient flow.
Recreation	Ongoing, continuous	Low visitor use; hunting season off-road travel and dispersed camping	Mostly along roads	Low	Localized physical soil and veg impacts
Weed Treatments	Ongoing, continuous	Estimated fewer than 100 acres treated since 1980s	Patchy, mostly along main routes	Low	Increased soil moisture, nutrients, and stability
Structures	Nearly all in place before 1980	A few ranch buildings; a natural gas pumping station	In eastern half of allotment	Moderately high in localized areas; low across entire area	Localized physical soil and veg impacts
Wilderness Designations	2009	50,266 acres	Along Owyhee River corridor	Low	Vehicle restrictions reduce soil and plant disturbance; reduced potential for weed spread

3.5.2.3.1 Alternative 1 Effects

Alternative 1 would have direct and indirect effects to upland watershed soil and hydrologic function, as described in Section 3.5.2.2. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternative 1 would cumulatively have small incremental negative effects on upland soils and their associated processes.

While the cumulative effects would be minor, the unchanged stocking rates in Alternative 1, combined with the utilization of key forage species during critical growth periods, would not improve the overall vegetation health of the uplands. In the absence of adequate recovery periods for plant communities, the negative effects of the grazing scheme would contribute to a cumulative increase in soil impacts and upland erosion. The approximately 8 percent of soils rated for severe erosion potential would be further at risk since limited to no progress toward improved soil and upland watershed resource issues are made.

Under Alternative 1, the combined effects of the proposed grazing management, lack of improvement to vegetation, and resulting direct and indirect effects to soils would not be beneficial to upland watershed health. When these effects are considered in conjunction with the past, present, and reasonably foreseeable future actions that also affect soils in the CIAA, Alternative 1 has the highest risk to cumulatively increase erosion.

3.5.2.3.2 Alternative 2 Effects

Alternative 2 would have direct and indirect effects to upland watershed soil and hydrologic function as described in Section 3.5.2.2. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternative 2 may cumulatively have small incremental positive effects on upland soils and their associated processes, but the allotment might fail to make significant progress toward meeting Standards over the long term.

Alternative 2 includes grazing use adjustment protocols proposed by the permittee that could have desirable direct and indirect effects on soils, despite an increase in stocking rate and extended growing season use. Recovery of plant species composition and biodiversity of desirable key forage species would be promoted through the use of the protocols. The resulting maintenance and increased soil surface protection, as well as decrease in sediments, could have desirable effects on upland soil and watershed health initially and would therefore provide slightly improved conditions due to additional protection, compared to the implementation of Alternative 1.

The impacts from Alternative 2 would have a positive cumulative effect over Alternative 1 by decreasing sediment movement that would otherwise be destined to reach riparian areas and streams. However, the immediate increase in stocking rates at the beginning of the permit, as well as the impending additional increase in livestock numbers during the remaining life of the permit, increases the potential of generating deteriorating impacts that would contribute to a cumulative increase in upland erosion.

The approximately 8 percent of soils rated for severe erosion potential would be further at risk since there would be limited to no progress made toward improved soil and upland watershed resource issues. Alternative 2 would therefore provide slightly improved conditions due to additional protection, compared to the implementation of Alternative 1, but contributes less protection than Alternatives 3, 4, and 5 because protocols are less restrictive. When these effects are considered in conjunction with the past, present, and reasonably foreseeable future actions that also affect soils in the CIAA, upland soils and watershed health standards would continue to fail to make significant progress toward meeting Standards over the life of the permit.

3.5.2.3.3 Alternatives 3, 4, and 5 Effects

Alternatives 3, 4, and 5 would have direct and indirect effects to upland watershed soil and hydrologic function as described in Section 3.5.2.2. Specifically, the alternatives would improve plant communities at variable magnitudes and result in improved soil and hydrologic function that reduce erosion potential at the corresponding levels. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternatives 3, 4, and 5 would cumulatively have small incremental positive effects on upland soils and their associated processes.

Alternative 3 includes performance-based terms and conditions that would have desirable direct and indirect effects on soils, despite an increase in stocking rate and initial growing season use. Adequate recovery of plant species composition and biodiversity of desirable key forage species would be promoted through the use of the performance-based terms and conditions. The resulting increased soil surface protection and decrease in sediments would have desirable effects on upland soil and watershed health. Considering the past, present, and reasonably foreseeable future actions influencing soils in the CIAA, the impacts from Alternative 3 would have a positive cumulative effect over Alternatives 1 and 2 by decreasing sediment movement that would otherwise be destined to reach riparian areas and streams.

The season-based Alternative 4 is expected to have similar positive cumulative effects as Alternative 3; however, because Alternative 4 would restrict grazing during the critical growth season of desirable key forage species altogether and result in reduced stocking rates that are further decreasing grazing impacts, Alternative 4 would provide additional protection compared to the implementation of Alternatives 1, 2, and 3.

Alternative 5 would provide extended rest from livestock grazing over the life of the permit. The improvements would be similar to Alternatives 3 and 4, though the incremental effects associated with the recovery of soil stability, hydrologic function, and nutrient cycling affecting upland soils and watershed health would occur at a faster rate due to the absence of livestock grazing. Cumulatively, this would offer the greatest benefits to the CIAA.

All three alternatives would maintain and benefit upland soils at varying degrees and result in the capture, storage, and safe release of precipitation, as well as improve energy flow and nutrient cycling in the analysis area. The approximately 8 percent of soils rated for severe erosion potential would experience less risk, since improvements toward soil and upland watershed resource issues are made. The proposed changes in grazing management would make progress toward meeting Rangeland Health Standards and ORMP objectives and cumulatively provide improvements to the CIAA.

3.5.3 Special Status Plant Species

3.5.3.1 Affected Environment

Several peripheral special status species occur along the outside perimeter of the Garat allotment and in the Owyhee River canyon rimrock or riparian habitat. However, only five BLM special status plant species are known to occur within the Garat allotment: stream orchid (*Epipactis gigantea*)[59], rattlesnake stickseed (*Hackelia ophiobia*), inch-high lupine (*Lupinus uncialis*), Newberry's milkvetch (*Astragalus newberryi* var. *castoreus*), and Davis' peppergrass (*Lepidium davisii*) (Stohlgren, Binkley, Chong, & Kalkhan, 1999) (Rosentreter, 1994). Slickspot peppergrass (*Lepidium papilliferum*) is listed as threatened under the Endangered Species Act and occurs in eastern Owyhee County, but no known populations occur in the Garat allotment[60].

Information for existing conditions in the Garat allotment was provided through Elemental Occurrence (EO) reports from the Idaho Department of Fish and Game Heritage Program (IDFG) and observation reports from the Owyhee Field Office. (Data was analyzed for Special Status Plant Species (SSPS) updates. Special Status Plant Species Elemental Occurrence reports provide updates on special status species for this allotment.) (Map SSPS-1) The IDFG provided plant observation protocols using methodologies described in their report protocol. All other reports reviewed use best practice science in updating rare plant occurrences and reporting to IDFG updates. The Idaho BLM keeps a current SSPS list, which is updated in coordination with the Idaho Native Plant Society using principles and methods from the NatureServe (NatureServe) rarity ranking calculator. (NatureServe and its natural heritage program members have developed standardized methods for gathering, managing, and analyzing biological and ecological data, referred collectively as Natural Heritage Methodology.)

Focal Special Status Plant Species

The known populations of rattlesnake stickseed, Inch-high lupine and Newberry's milkvetch indicate that these plants are neither increasing nor declining as a population; however, there is insufficient information to determine site-specific impacts of livestock grazing on these particular special status plants.

Rattlesnake stickseed[61] (*Hackelia ophiobia*) is a perennial forb that occurs in crevices on the shady north face of canyon walls or at the base in rhyolite cliffs or talus habitats of the Owyhee River. It has a blue corolla with a cream or yellowish tube. In 2005, these previously observed populations, and new

[59] Current information for this species shows no known populations of Ute ladies'-tresses occur in the Garat allotment.
[60] Memorandum decision and order, US District Court, Case No. 1:11-ev-oo358-CWD, Aug. 8, 2012. Listing of *L. papilliferum* as a threatened species under the Endangered Species Act is vacated; however it is remanded for further consideration.
[61] Other common names are Owyhee forget-me-not and Owyhee River stickseed.

occurrences were reported to be very vigorous and in excellent condition. This plant is a BLM Type 3 species that are globally rare or very rare in Idaho, with moderate endangerment factors. Their global or state rarity and the inherent risks associated with rarity make them imperiled species.

Inch-high lupine (*Lupinus uncialis*) is a BLM Type 4 species. Type 4 species are considered sensitive, with small or localized populations. These species are not globally rare but may be jeopardized without active management or removal of known threats. Inch-high lupine is a stemless annual plant with very small yellowish-white flowers that typically occurs in sparsely vegetated areas of rhyolite and volcanic cinder with springtime standing water or runoff accumulation in Wyoming big sagebrush and low sagebrush plant communities.

Newberry's milkvetch (*Astragalus newberryi* var. *castoreus*) is a low-growing perennial found on lakebed sediment badlands of Wyoming sagebrush-shadscale (*Atriplex confertifolia*) juniper woodland habitats. This forb's flowers have vivid pink-purple, pink or whitish petals. Newberry's milkvetch is a BLM Type 4 species. Due to the small populations and habitat area, future land uses in close proximity could jeopardize these species.

Figure SSPS-2: *Astragalus newberryi* var. *castoreus*

Davis' peppergrass (*Lepidium davisii*) is a white-flowered, deep-rooted perennial forb occurring in playas formed by vernal pools within Wyoming big sagebrush plant communities and is ranked as a BLM Type 3 species (Figure SPSS-1). Davis' peppergrass plants tend to be an extremely long-lived, slow-growing plant (Tuason, 2005). The global or state[62] rarity and the inherent risks associated with rarity make this an imperiled species with moderate endangerment factors. Davis' peppergrass is the only species with quantitative data collection (Mancuso, 2011). The extirpation of Davis' peppergrass at two playas in Idaho was attributed to severe cattle trampling disturbance (Mancuso, 2011).

Table SSPS-4: Garat special status plant occurrences by pasture

		Pasture and No. of Occurrences					
Scientific Name	**Common Name**	**1**	**2**	**3**	**4**	**5**	**6**
Hackelia ophiobia	Rattlesnake stickseed			17			
Lupinus uncialis	Inch-high lupine						9
Astragalus newberryi var. *castoreus*	Newberry's milkvetch	5					

[62] G-3 ranking (NatureServe).

		Pasture and No. of Occurrences					
Scientific Name	**Common Name**	**1**	**2**	**3**	**4**	**5**	**6**
Lepidium davisii	Davis' peppergrass						30

3.5.3.2 Direct and Indirect Effects

The objective specified in the management plan for special status species is to "manage special status species and habitats to increase or maintain populations at levels where their existence is no longer threatened and there is no need for listing under the Endangered Species Act of 1973, as amended." To assess and interpret whether this objective is met for a special status plant species, the BLM utilizes information collected by the IDFG Heritage Program and collects additional species information internally. Information for existing conditions in the Garat allotment was provided through Elemental Occurrence (EO) reports from the IDFG Heritage Program and observation reports from the Owyhee Field Office. (Special status plant data was analyzed for updates from 1979 to 2012.) (Map SSPS-1) All other reports reviewed use best-practice science in updating rare plant occurrences. The Idaho BLM keeps a current SSPS list, which is updated in coordination with the Idaho Native Plant Society using principles and methods from the NatureServe (NatureServe) rarity ranking calculator (NatureServe and its Natural Heritage Program members have developed standardized methods for gathering, managing, and analyzing biological and ecological data, referred collectively as Natural Heritage Methodology.).

Each plant has unique habitat needs and resilience to disturbance. In Table SSPS-5, some of the effects of livestock grazing on special status plant species habitats are listed by season of use. (Plant descriptions are located in 3.5.3.1 of this EA.)

Table SSPS-5: Effects of livestock grazing on Special Status Plant Species habitats by season of use; similar in context to Table RIPN-10

Season of Use	**Issues & Impacts**	
Spring (March-June)	▪ Soil compaction	• increased exposed ground, increasing erosion • removal of vegetation • increased non-native species • decreased herbaceous cover • decreased species and age diversity • decline of biological soil crust • reduced groundwater recharge • reduced wildlife habitat
	▪ Selective grazing on palatable species	• decrease soil stability • decreased vegetative diversity • decreased pollinator forage • impaired wildlife habitat
All Seasons	▪ Loss of herbaceous vegetation	• decreased soil stability • change in functional and structural groups • removal of vegetation • decreased pollinator forage • decreased vegetation reproductive capabilities • reduced habitat quality for insects

Season of Use	Issues & Impacts	
		• reduced water infiltration • decline of biological soil crust • increased soil erosion • reduced wildlife habitat • reduced aesthetic value
	▪ Manure deposition, trampling and congregation	• decreased soil stability • removal of vegetation • increased non-native species • decreased pollinator forage • nutrients, pathogens, and bacteria added to ecological system • reduced habitat quality • reduced aesthetic value
	▪ Water and salt placement	• decreased soil stability • removal of vegetation • removal of biological soil crust • loss of shrub understory • decreased pollinator forage • increased non-native species • reduced wildlife habitat • reduced aesthetic value

(Adapted from (Bellows, 2003) and (Belsky, Matzke, & Uselman, 1999))

Summary
Season of grazing use is an important consideration for Davis' peppergrass, and grazing during the key growing period should be kept to a minimum or eliminated completely during times of saturation, mainly spring and winter. Late-summer light mechanical disturbance may be tolerated post-seed set, when the plant is more resistant and the habitat is less susceptible to trampling during dry conditions. The analysis determined that impacts from livestock have been a factor in the deterioration of some of the playa habitats in the Garat allotment; consequently, Standard 8 (Threatened and Endangered Plants and Animals) did not meet habitat objectives (USDI BLM, 2012b).

A successful grazing strategy will:

- Limit grazing intensity and season of use to provide sufficient rest to encourage plant vigor, regrowth, and energy storage;
- Ensure sufficient vegetation during period of reproductive morphology;
- Control the timing of grazing to prevent loss of ecological site functional structural groups.

3.5.3.2.1 Alternative 1 Effects

Implementation of Alternative 1 would continue current livestock management actions. Current livestock management on the Garat allotment has led the allotment to fail to meet the Idaho Rangeland Health Standard for special status plant species for Davis' peppergrass. This special status plant is found in pasture 5, where a spring rest/rotation grazing regime was prescribed in 1993. The resource issues are identified in the allotment assessment (USDI BLM, 2012b) and the general impacts by season of use are displayed in Table SSPS-5. Under Alternative 1 – Current Situation, the current grazing scheme would more or less continue, and the health of special status plant species would remain the same or incur additional impacts because spring or early growing season grazing does not provide rest during the growing period, limiting seed and root development. If Alternative 1 is implemented, improvement to Davis' peppergrass is not expected. There is insufficient information to determine current status to site-specific impacts for all other SSPS plants from this alternative in the Garat Allotment; however, the special status plant species would continue in their known status under this grazing scheme.

3.5.3.2.2 Alternative 2 Effects

As noted in 2.8.2.2, Alternative 2 is the permittee's application. SSPS resource issues are identified in the allotment assessment (USDI BLM, 2012b) and in Table SSPS-2. Alternative 2 would increase spring or early growing season grazing and does not provide rest during much of the growing period, limiting seed and root development. Alternative 2 would provide little to no improvement to the conditions within the analysis area due to an increase of AUMs by 21 percent and potentially long-term to 78 percent in the absence of extended rest or deferment of the recommended 2 out of 3 years.

Alternative 2 provides little to no improvement over Alternative 1 and has a greater potential to eventually fail to meet objectives ORMP for the duration of the 10-year permit, since stocking rates would allow grazing to continue to be scheduled during the critical growing season with minimal rest and deferment.

3.5.3.2.3 Alternative 3 Effects

Previously described in 2.8.2.3, this alternative is performance-based and would authorize grazing with livestock numbers and grazing schedule equal to those identified in the current permit but add performance-based criteria (Section 2.3) to the existing terms and conditions. SSPS resource issues identified in the allotment assessment (USDI BLM, 2012b) and the general impacts by season of use are displayed in Table SSPS-2.

The most important components of Alternative 3 regarding special status plants are the absence of a greater intensity of livestock and the more conservative 20 percent utilization limit during the active growing season. These terms and conditions protect special status plants because the performance-based alternative would increase opportunity to improve and maintain native perennial vegetation health and vigor, subsequently creating an improved habitat for SSPS. Because of the performance-based terms and conditions, the progress toward a full complement of native perennial species consistent with ecological site potential would result overall in improved existing conditions within the plant community, which, in turn, would benefit desired conditions for special status plant species.

3.5.3.2.4 *Alternative 4 Effects*

Alternative 4 would implement periodic deferment outside of critical growing season use and decrease active AUMs, resulting in an overall allotment-wide decrease in active use AUMs compared to the authorized AUMs under the Current Situation alternative (Appendix D). Alternative 4 would reduce utilization to levels below 35 percent, as recommended in the ORMP.

This alternative consists of alternating years of deferment or use during the active critical growing season. Special status plant species and vegetative vigor of native perennial bunchgrasses would be maintained or increased. Pastures 1 and 2 benefit the most from Alternative 4 because grazing would discontinue after a 1-month period early in the critical growing season every year and would provide opportunity for regrowth before the dormant period, thereby securing seed and root production.

Alternative 4 would protect special status plants because this alternative decreases the number of current AUMs compared to Alternative 1 (Appendix D). The reductions in livestock numbers reduce the concentration in and around the playas where one SSPS plant, Davis' peppergrass, grows. The reduced intensity of livestock will allow progress to be made toward meeting Standard 8 for special status plant species, specifically Davis' peppergrass.

Alternative 4 would protect special status plants by increasing the opportunity to improve soil impacts and maintain native perennial vegetation health and vigor, subsequently creating a healthy habitat for SSPS. The terms and conditions, in particular the alternate years of deferment, allow progress toward a full complement of native perennial species consistent with ecological site potential. This alternative would result in overall improvement, which, in turn, would benefit desired conditions for special status plant species (Davis' peppergrass) in this allotment.

3.5.3.2.5 Alternative 5 Effects

Alternative 5 would eliminate all grazing in the Garat allotment for 10 years and make the most significant progress towards desired conditions because special status plant species impacts would be expected to decline and would only be affected by wildlife. This alternative would provide for the most unimpeded and rapid improvement of special status plant species within the native plant communities, soil improvements, water resources and riparian areas, and wildlife affected by livestock grazing.

3.5.3.3 Cumulative Effects

The cumulative impacts focus on the aggregate effects of the past, present, and reasonably foreseeable future actions that are meaningful and must analyze the significant effects of the proposed action and alternatives. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within 3 years.

Plants do not have political boundaries and are ranked on a global and state rarity ranking. The CIAA for SSPS incorporates and extends beyond the allotment boundary to capture the assessment units (plant populations) within the watershed boundaries for Group 1 EA. The watersheds include Deep Creek, the Headwaters Deep Creek, and the Red Canyon/ Owyhee River watersheds.

Focal Special Status Plant Species

Rattlesnake stickseed: This plant occurs at multiple locations along the rhyolite cliffs and talus slopes of the Owyhee River. The remote and precipitous nature of these locations provides adequate protection from impacts, and therefore, there is very low probability of disturbance.

Newberry's milkvetch: This plant is found on lakebed sediment badlands of Wyoming sagebrush-shadscale (*Atriplex confertifolia*) juniper woodland communities. Newberry's milkvetch is not targeted as grazing forage for livestock; on occasion, there may be incidental consumption of the plants. Since livestock do not seek out Newberry's milkvetch as grazing forage, the threat is from the trampling of the plants and loss of habitat from other possible contributing disturbances (OHV, mountain bicycling, camping, hunting, etc.).

Inch-high lupine: This diminutive plant occurs in elevations between 4,265 and 4,593 feet. Annually, it blooms May through June and grows in volcanic cinder soils; cumulative threats are from the trampling of the plants and loss of habitat from other possible contributing disturbances (OHV, mountain bicycling, camping, hunting, etc.) (Atwood & DeBolt, 2000).

Davis' peppergrass: Although Davis' peppergrass is not targeted as grazing forage for livestock, on occasion there may be incidental consumption of the plants. Since livestock do not seek out Davis' peppergrass as grazing forage, the threat is from the trampling of the plants. Further, the attraction for cattle to congregate in the playas is associated with water use and rest areas; however, the most immediate and obvious threat is hoof print depressions that crush individual plants and cause low vitality and death. Another concern with trampling in the playas is that it can cause the photosynthetic portion of the plant to be injured and branches to be broken off, which reduces the amount of energy that plants can produce that year and, under prolonged circumstances, could result in the death of the plant, reducing overall plant populations (Tuason, 2005).

Livestock concentration and trampling within the playa can cause increased erosion and changes in soil structure. The Davis' peppergrass seeds germinate within the cracks that are formed once the playas are dry. If the cracks in the playas are filled with silt and other debris, the available habitat for native seeds to germinate decreases, which alters the hydrologic system of the playa and provides opportunities for non-native invasive plants to take over any available habitat (Rosentreter, 1994). Soil mixing from trampling also alters the hydrology, further degrading the fragile playas.

Season of grazing use is an important consideration for Davis' peppergrass, and grazing during the key growing period should be kept to a minimum or completely eliminated during times of saturation, mainly spring and winter. Late-summer light mechanical disturbance may be tolerated post-seed set, when the plant is more resistant and the habitat is less susceptible to trampling during dry conditions. Due to the small populations and habitat area, certain future land uses in close proximity could significantly jeopardize these species. Cumulative threats to this plant include direct disturbance and habitat alteration from livestock use, stock pond development in playas, which is the most critical threat, as well as OHV use, salt block placement, and increased erosion into playas from degradation of the surrounding habitat (USDI BLM, 2006b).

Figure SPSS-6: Davis' peppergrass, seed set (left) and flowering (right)

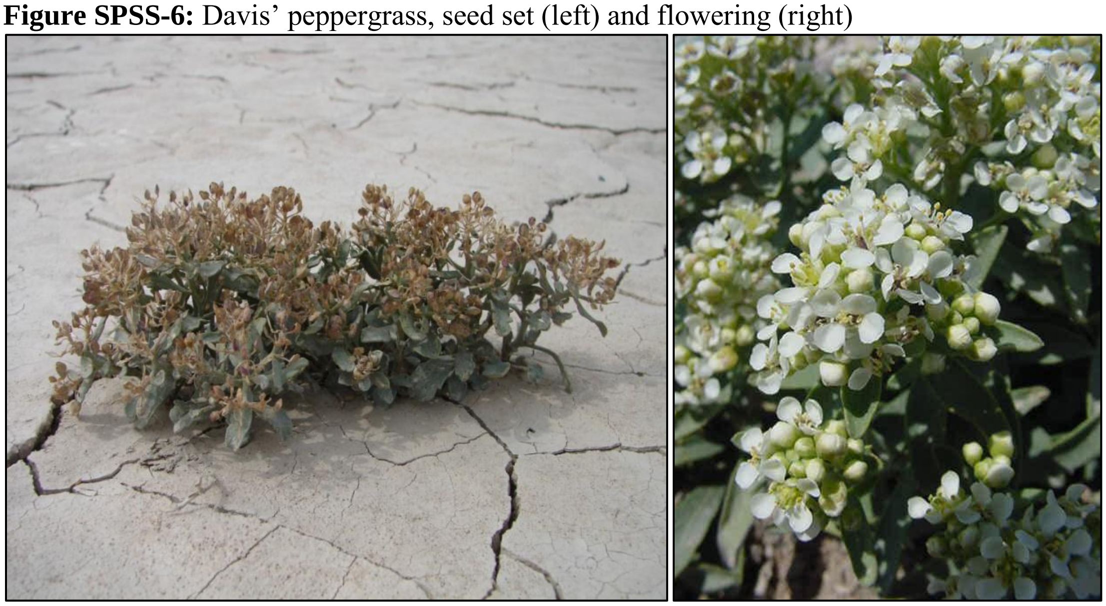
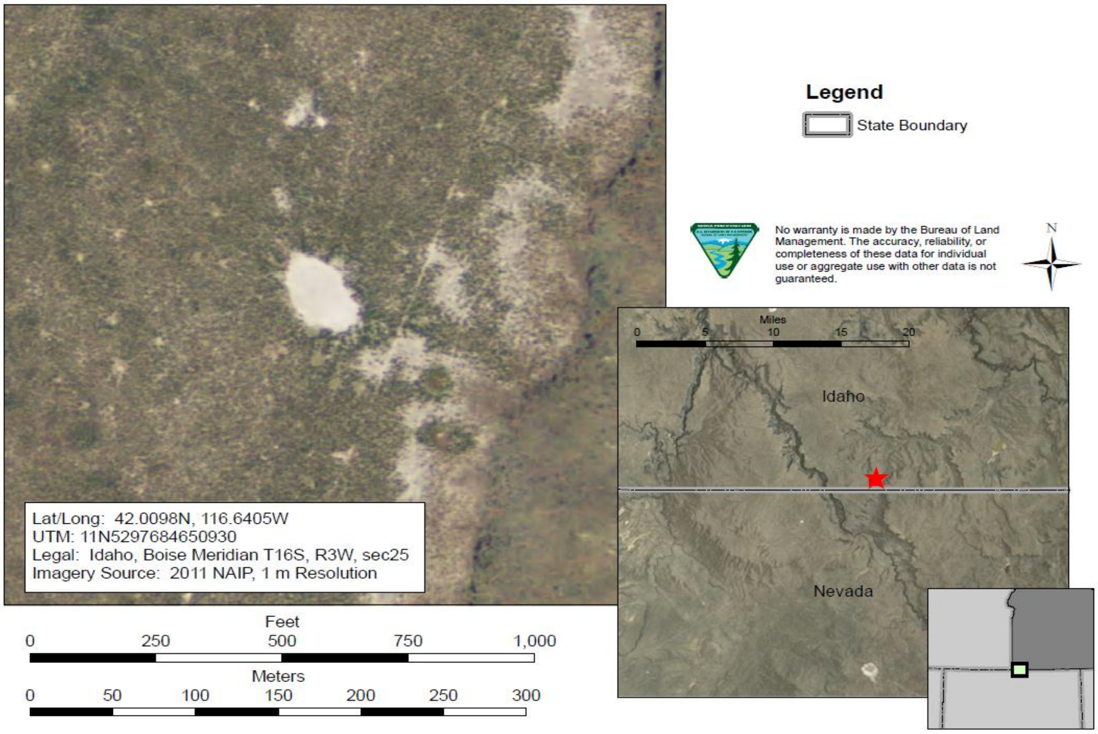


Figure SPSS-4: Playa location/Map: Homer Wells Reservoir West

Playa location/Map



Cumulative Impact Area Activities

Figures in the following table of past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts were calculated using BLM GIS data. Data are approximate.

Table SSPS-6: Past, present, and foreseeable actions within the Garat allotment CIAA

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing Allotments	22 active BLM allotments	Permits are renewed/modified as they expire: 4 to be processed by 2015
Wildfire	82,663 acres (between 1985-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical	28,378 acres (1952-2011)	9,750 acres
Noxious Weed Presence	47 infestations covering about 40 acres	Fewer than 10 acres/year of new infestation anticipated
Agriculture	57 acres	None
Roads (all are unpaved)	281.5 miles	None

3.5.3.3.1 Alternatives 1 and 2 Effects

Past, present and reasonably foreseeable actions and natural events that affect vegetation communities within the cumulative effects analysis area for the Garat allotment are presented above in Table SSPS-6. Livestock grazing is the dominant land use activity in the area, and almost all of the land area is managed for grazing. Allotments in this area are primarily grazed throughout the spring and summer. If Alternatives 1 or 2 were implemented the cumulative progress for native plant communities, soils, water resources and riparian, and wildlife would be a slow progress to improved habitat in the analysis area for the Garat allotment. Special status plant species require a functioning habitat with all structural functional groups represented to reduce pressure on unique margins of habitat where these plants live. If under Alternatives 1 or 2 this does not happen, the special status plant species are at risk in their narrow niches within the 10-year permit.

3.5.3.3.2 Alternatives 3 and 4 Effects

Compliance with criteria for the improved sage-grouse habitat proposed under Alternative 3 would improve the condition of special status plant species within the analysis area. The season-based Alternative 4 is expected to have additional benefits over Alternative 3 because the reduction in livestock numbers and incorporation of season-based rest and deferment from the critical growth period would increase upland plant growth, vigor, and cover, and result in decreased adverse impacts to SSPS habitat. Both alternatives would maintain and improve upland habitats. Special status plant species require a functioning habitat with all structural functional groups represented to reduce pressure on unique margins of habitat where these plants are found.

The season-based alternative would allow progress to be made toward meeting land-use plan special status plant species objectives, similar to that under the performance-based alternative. The season-based Alternative 4 is expected to have additional benefits over Alternative 3 because the reduction in livestock numbers and incorporation of season-based rest and deferment from the critical growth period would increase upland plant growth, vigor, and cover, and result in decreased adverse impacts to special status plant species. Avoiding or limiting spring/winter livestock trampling would be beneficial in the Garat allotment. Both alternatives would maintain and improve upland habitats in the analysis area. Present and future proposed changes in grazing management, when added to these alternatives, are expected to benefit special status plant species, increasing deep-rooted native perennial bunchgrasses, species diversity and improve the analysis area on a landscape level.

3.5.3.3.3 Alternative 5 Effects

Cumulative effects of Alternative 5 would combine extended rest from livestock grazing and proposed changes in grazing management in adjacent allotments aimed at making progress toward meeting rangeland health Standards. The impacts would be similar to Alternatives 3 and 4 though the incremental effects from the various resource improvements would occur at a faster rate due to the absence of livestock grazing. Cumulatively, this would offer the greatest benefits to the special status plant species in the analysis area.

3.5.4 Water Resources and Riparian-Wetland Areas

3.5.4.1 Affected Environment

Introduction

The Garat allotment falls within both the Upper Owyhee watershed, (4th Field Hydrologic Unit Code (HUC) number 17050104), and the South Fork Owyhee River watershed (HUC 17050105). The Upper Owyhee watershed encompasses a large area in southwest Idaho and produces the headwaters for the

Owyhee River, also known as the East Fork, that originate in the Independence and Bull Run Mountains in northern Nevada. Within the Idaho portion of the watershed, there are 15 assessment units (AUs). AUs are groups of similar streams with the same stream order that have similar land use practices, ownership, or land management. The Idaho Department of Environmental Quality (IDEQ) has completed total maximum daily loads (TMDLs) for sediment and temperature for the AUs, but they still do not meet their beneficial uses, which include cold-water aquatic life and primary contact recreation. The goal of the TMDLs is to achieve State of Idaho water quality standards and to restore and maintain a healthy and balanced biological community for the full support of cold-water aquatic life and salmonid spawning. Cold-water aquatic life water bodies are defined as water-quality appropriate for the protection and maintenance of a viable aquatic life community for cold-water species. Two listed units are reservoirs: Juniper Basin and Blue Creek Reservoirs.

The South Fork Owyhee River Watershed is located in the far southwestern portion of Idaho and originates in the north central portion of Nevada. The area is predominately open desert and deep canyons. The hydrology of the South Fork Owyhee River is the river itself. There are no perennial streams that feed the river within Idaho. The South Fork Owyhee River is subject to flashy flow conditions, with peak flows occurring anytime from January to June. With the exception of temperature, the water quality meets the Idaho Water Quality Standards (IDEQ). Water temperatures often exceed water quality standards for the protection of both cold-water biota and salmonid spawning. Warm water temperatures may be the most important factor limiting the presence of trout species. There is no indication that sediments are impairing beneficial uses (Idaho DEQ).

In 1996, the South Fork Owyhee River was listed as water quality-limited and placed on the 1996 303(d) list in accordance with the Clean Water Act. The designated beneficial uses are: cold-water biota, salmonid spawning, primary and secondary contact recreation, agricultural water supply, special resource waters and domestic water supply. Other protected uses include industrial water supply, wildlife habitat, and aesthetics. The listed pollutants that may be impairing the beneficial uses are temperature and sediments (Idaho DEQ). Currently, the streams that are identified by the Idaho Department of Environmental Quality as not supporting the beneficial use include the South Fork Owyhee River and Juniper Basin Reservoir. There are no streams on the 303(d) list at this time.

Based on the National Hydrography Dataset (NHD), riparian and water resources within the allotment include more than 500 miles of intermittent and ephemeral streams (2.5 miles support riparian vegetation (USDA FSA, 2011)), and numerous man-made reservoirs (Table RIPN-15). The NHD does not differentiate between intermittent and ephemeral streams. An ephemeral stream is one that flows only in direct response to precipitation during normal water years, and often does not support riparian plant communities. Most of the streams within the Garat allotment are ephemeral drainages that do not support riparian-wetland areas. The major drainages that do support intermittent flow and riparian vegetation include Piute Creek and the Owyhee River.

The current BLM range improvement database identifies 84 reservoirs that fall within the allotment.

Table RIPN-15: Total miles of perennial and intermittent stream, and number of springs within the Garat allotment pastures (NHD)

Pasture	Perennial Miles	Intermittent/Ephemeral Miles	# Reservoirs	# Springs
1	0	40.75	6	0
2	0	63.6	8	0
3	0	171.8	24	0
4	0	112.9	24	0
5	0	104.8	10	5
6	0	157.8	12	0

Desired Conditions and Objectives

The EA and the resource objectives tier in part to those identified in the ORMP EIS. The objective specified in the management plan for both riparian-wetland areas and stream channels is to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions. Riparian-wetland areas include streams, springs, seeps, and wetlands. The BLM has primarily utilized the lotic and lentic[63] proper functioning condition (PFC)[64] protocol to measure whether the objective is being met. The PFC assessment is a qualitative determination that refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian-wetland areas. Essentially, a PFC determination rates the state of resiliency that will allow a riparian area to hold together during a high-flow event, which then allows the area to provide desired values (i.e., wildlife habitat).

The ORMP objective for water quality is to meet or exceed State of Idaho water quality standards on all federally administered waters. To assess and interpret whether this objective is met for an area, a stream, and/or a stream segment, the BLM utilizes watershed information collected by IDEQ and collects water temperature and bacteria information internally.

Current Condition

The 1999 ORMP identified perennial and fish-bearing streams that occur on public lands, along with an assessment of the mileage present and the condition at the time. The ORMP identified 7.38 miles of the Owyhee River in unsatisfactory condition and 6.86 miles in satisfactory condition.

The Garat allotment has numerous ephemeral channels that flow only in direct response to precipitation during normal water years, and often do not support riparian plant communities. Although important, these areas are not assessed for riparian proper functioning condition. However, the watershed section and Standard 1 evaluates and assesses the soils and hydrologic function of these areas.

Overall, streams and springs that support riparian areas are limited within the allotment. However, conditions of those that do support riparian areas and have been assessed as less than properly functioning are not meeting the ORMP objectives.

---

[63] Lotic = flowing water. Lentic = standing water, e.g. a seep, spring, or pond.
[64] PFC Assessments are based (USDI BLM, 1998a) and (USDI BLM, 1998b)

Pasture 1 - Dry Lake
According to the NHD, pasture 1 of the allotment contains approximately 40.75 miles of intermittent streams and six range improvements (reservoirs). The streams in pasture 1 are ephemeral and do not support riparian-wetland area. None of the streams or reservoirs in pasture 1 has been assessed.

Pasture 2 – Piute Creek
According to the NHD, pasture 2 contains 63.6 miles of intermittent streams and eight range improvements (reservoirs). The streams in pasture 2 are mostly ephemeral, and only about 2.5 miles support riparian-wetland vegetation (USDA FSA, 2011).

Western Range Service conducted a stream classification analysis in 2002 and concluded that 4.5 miles of Piute creek between Piute Basin Reservoir and the Owyhee River (includes 2.6 miles in pasture 2) are not dependent on riparian vegetation for stream bank stability.

Pasture 3 - Forty-Five Field
According to the NHD, pasture 3 contains 171.8 miles of intermittent streams and 24 range improvements (reservoirs). Most of the streams in pasture 3 are ephemeral and do not support riparian-wetland areas; however, about 2.75 miles of Piute Creek support riparian vegetation (USDA FSA, 2011).

Approximately 1.5 miles of Piute Creek north of the Piute Basin Reservoir were assessed in 2004 as FAR[65] (Map RNGE-3), and is a segment of a longer reach that extends into pasture 4. This reach of the creek is influenced by water backing up from the reservoir, which has altered the natural and desired width and depth ratios. The reach lacks woody riparian vegetation, and may lack the potential to support it. The assessment indicated that the reach appears to be static with no apparent trend in condition.

Western Range Service conducted a stream classification analysis in 2002 and concluded that 4.5 miles of Piute creek between Piute Basin Reservoir and the Owyhee River (includes 0.7 miles in pasture 3) are not dependent on riparian vegetation for stream bank stability.

Pasture 4 – Kimball
According to the NHD, pasture 4 contains 113.9 miles of intermittent streams, two springs, and 24 range improvements (reservoirs). Most of the streams in pasture 4 are ephemeral and do not support riparian-wetland areas; however, about 1.3 miles of Piute Creek support riparian vegetation (USDA FSA, 2011). Approximately 1.0 mile of the stream was assessed FAR in 2004 and is a portion of the same reach that extends into pasture 3.

In 2003, the two reservoirs/springs in pasture 4 were assessed as non-functioning (Map RNGE-4). However, the PFC protocol used to assess the springs may not be appropriate, based on the reservoir nature of the water developments. The intent of the PFC protocol and the indicators used to assess functional condition of riparian-wetland areas are no longer applicable because the spring sources have been altered and no longer provide the form and function associated with riparian-wetland areas. The two spring areas do not support riparian vegetation (USDA FSA, 2011).

Western Range Service conducted a stream classification analysis in 2002 and concluded that 4.5 miles of Piute creek between Piute Basin Reservoir and the Owyhee River (including 1.2 miles in pasture 4) are not dependent on riparian vegetation for stream bank stability.

[65] FAR (functional-at-risk) indicates that the riparian-wetland area does not have sufficient vegetation, landform, or large woody debris to dissipate stream energy, filter sediment, aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.

Pasture 5 - Big Horse
According to the NHD, pasture 5 contains 104.8 miles of intermittent streams, five springs, and 10 range improvements (reservoirs). The streams in pasture 5 are ephemeral and do not support riparian-wetland areas. However, the five springs are contributing sources to the SF Owyhee River and appear to support a large (about 250 acres) area of riparian-wetland vegetation. None of the streams or springs identified in the NHD has been assessed.

Pasture 6 - Juniper Basin
According to the NHD, pasture 6 contains 157.8 miles of intermittent streams and 12 range improvements (reservoirs). Most of the streams in pasture 6 are ephemeral and do not support riparian-wetland areas; however, about 2.65 miles of an unnamed creek at the southern edge of the pasture support riparian vegetation.

The Idaho Department of Environmental Quality (IDEQ) has assessed the watershed (Integrated report 2002) and assigned beneficial uses. Information collected by the state during the reconnaissance found issues with sedimentation and siltation of the water bodies within the watershed, and Juniper Basin Reservoir was placed on the 303(d) list of impaired waters. However, in their 5-year review (2009), IDEQ questioned the appropriateness of the designation based on the beneficial use (cold-water aquatic life) that was assigned to the reservoir, since the intent was for irrigation.

Juniper Basin Reservoir was not assessed for functional condition using the PFC protocol; however, field observations made in 2011 indicate there is heavy livestock use surrounding the reservoir. Distribution of grazing is concentrated adjacent to reservoirs and utilization is higher in these areas and decreases farther away from water sources.

3.5.4.2 Direct and Indirect Effects

Introduction

See the Common to All Allotments Section 3.3.1.4 for general introductory information common for the impact analyses for all allotments and all alternatives.

Table RIPN-16: Total miles of intermittent stream and spring areas that support riparian vegetation (derived from field assessments, NHD, & NAIP) within the Garat allotment

Pasture	Intermittent Miles Supporting Riparian Vegetation[66]	NHD # Springs	Total Spring Riparian Acres[35]
1 Dry Lake	0	0	0
2 Piute Creek	2.5	0	0
3 Forty-Five	2.75	0	0
4 Kimball	1.3	2	0
5 Big Horse	0	5	250
6 Juniper Basin	2.65	0	0

3.5.4.3 Direct and Indirect Effects

[66] Acres of riparian area were estimated in a GIS using 2011 NAIP imagery at a scale of 1:1000

3.5.4.3.1 Alternative 1 Effects

Under the 10-year average actual use, the three Rangeland Health Standards (2, 3, & 7) associated with the riparian and water resources are being met (USDI BLM, 2012b). However, implementation of Alternative 1 (for details, see Sections 2.1 and 2.8.2.1), would allow the maximum actual use reported over the past 10 years. Under this grazing scheme, the riparian and water resources could remain the same or incur additional impacts because the permit would allow for a 27 percent increase over the average actual use. The impacts by season of use are displayed in Table RIPN-2 in the Common to All Allotments section 3.3.1.4.

The water and riparian resources are minimal in the Garat allotment and occur in small areas of pastures 2, 3, 4, 5, and 6 (Maps RNGE-2 through RNGE-6). Under Alternative 1, pasture 2 would be grazed in conjunction with pasture 1 during the spring 2 years of the 3-year cycle. Pastures 3 and 4 would also be grazed during the spring 2 years of the 3-year rotation. When riparian areas are used during the spring, herbaceous plant species are foraged preferentially because they are green and growing, allowing shrubs to incur less browse. Also, during the spring, cooler temperatures and green upland forage disperse livestock, decreasing the compounding impacts associated with congregated livestock (disproportionate and overuse of both herbaceous and woody plant species, floodplain and in-stream trampling, soil compaction, and water quality). However, when livestock graze in riparian areas during the spring, impacts occur because grazing occurs when soils are typically wet. The static load of a cattle hoof is reported to range from 2.8 to 10.9 kg/cm^2 and can increase by two to four times when the animal travels (Powell, Cameron, & Newman, 2000); thus, when the soils are saturated, the physical damage to the stream bank, floodplains, and spring riparian areas increase. The increased soil compaction could cause an increase in erosion and sediment loading that would impair water quality and thus fish and aquatic habitat.

Pastures 5 and 6 would be grazed every year during the summer. Because upland grasses are often dry and temperatures are warmer during the summer months, livestock make disproportionate use of riparian areas and riparian herbaceous vegetation is preferred (Powell, Cameron, & Newman, 2000). Additionally, when riparian areas are open to grazing every year during the growing season, livestock congregate close to water where it is cooler and the forage is more palatable (Liggins, 1999), (Bryant, 1982), (Smith, Rodgers, Dodd, & Skinner, 1992) (Gillen, Krueger, & Miller, 1984). Once livestock have congregated along floodplains, in riparian-wetland areas, and in the stream channels, further impacts associated with stream bank trampling (Kauffman, Krueger, & Vavra, 1984), soil compaction (Marlow & Pogacnik, 1985), and water quality (Taylor, Gillman, & Pendretti, 1989) occur (Table RIPN-2). In-stream trampling, disturbance and erosion from denuded banks, reduced sediment trapping by vegetation, loss of bank stability, and increased peak flows lead to reduced habitat quality for both fish and aquatic species, reduced infiltration, and lowered water tables (Stevens, McArthur, & Davis, 1992). An increase in soil compaction created by congregated livestock (especially during spring grazing) causes an increase in erosion, decreased water infiltration rates and more runoff, reduced plant productivity, and thus less vegetative cover (Clary, 1995). Impacts associated with water quality include a potential increase in nutrient concentrations, bacteria, sediment, and water temperatures. Direct fecal deposition into and near water, runoff from disturbed stream banks, and hoof churn-up of contaminated sediments increase nutrient and bacteria concentrations (Taylor, Gillman, & Pendretti, 1989).

Under Alternative 1, the mileage of perennial and intermittent stream and the springs that would be impacted during the various seasons of use and within each of the pastures are shown in Table RIPN-16. The impacts would vary based on the ecologically important variables (i.e., stream gradient, annual precipitation, valley type), the vegetation community types, and the inherent stability of the systems.

Although each area is unique in its particular setting (stream characteristics, valley bottom type and soils, potential vegetation, relationship to upland topography and vegetation) and thus its ability to withstand impacts, in general, under Alternative 1, 6.55 miles of intermittent stream that support riparian vegetation and that occur within pastures 2, 3, and 4 would be impacted by spring grazing as described above. Within pastures 5 and 6, 2.65 miles of intermittent stream that support riparian areas, as well as about 250 acres of wetland area associated with the springs, would be impacted by summer grazing, as described above.

If Alternative 1 were implemented, the riparian and water resource issues and associated impacts would remain similar to the current condition. Rangeland Health Standards 2, 3 and would be met because the riparian areas are minimally functioning; however, there are important riparian areas where impacts are occurring and should be monitored.

3.5.4.3.2 Alternative 2 Effects

Alternative 2 (for details, see Sections 2.2 and 2.8.2.2) would allow the operator to choose the rest years in pastures 1 through 3 and 5; pasture 4 and 6 would not be rested. When not rested, pastures would be grazed early spring through the summer. Consequently, the riparian-wetland areas and streams would incur grazing during the critical parts of the riparian area growing period, and the system provides no rest in pastures 4 and 6, usually resulting in heavy use of both the herbaceous and woody riparian plant species (Elmore W. , 1994). Furthermore, as described in detail under Alternative 1 impacts above, concentrated livestock in the riparian areas that occurs disproportionately during the dry, warm summer months negatively impacts water quality, stream channel morphology, riparian soils, and local aquatic and terrestrial species (Roche, 2003).

The implementation of Alternative 2 would degrade the riparian and water resource condition. Approximately 9.2 miles of stream that support riparian vegetation and 250 acres of riparian-wetland area associated with the springs in pasture 5 would be impacted by both spring and summer grazing, as described above in all pastures during non-rest years. Thus, the Idaho Rangeland Health Standards associated with the water and riparian resources (2, 3, and 7) would not be met.

3.5.4.3.3 Alternative 3 Effects

Implementation of Alternative 3 (for details, see Sections 2.3 and 2.8.2.3) would include performance-based terms and conditions that were developed for both lotic and lentic riparian-wetland areas. The term and condition specific to riparian-wetland areas associated with Alternative 3 (T&C # 13) includes measurements for herbaceous stubble height, woody browse, and alteration caused by livestock along the margins of the riparian-wetland areas. Compliance with the annual, short-term indicators of conserving an herbaceous stubble height of 6 inches and a riparian shrub use level less than 30 percent would minimize the removal of stabilizing, hydric species, allowing the stream banks and channels to withstand high flow events. Since the banks would be stable and vegetated, erosion would decrease and aquatic species habitat would improve. Additionally, compliance with the stream bank alteration term and condition would lessen the impacts associated with the shearing and compaction of riparian-wetland soils caused by livestock congregating in riparian areas, including increased erosion and stream temperatures, lowered water table and loss of hydric vegetation, all of which decrease aquatic species habitat. Overall, the implementation of and compliance with the terms and conditions would allow the water and riparian resources to make progress toward the attainment of the long-term indicators (i.e., appropriate channel widths and depths and stable banks) and resource objectives.

Consistent compliance with the performance-based terms and conditions under Alternative 3 would allow the riparian and water resources to incur fewer of the impacts described under Alternative 1 and in Table RIPN-2. Specifically, compliance with the herbaceous stubble height and woody browse standards would minimize the direct removal of vegetation and the compounding impacts (i.e., reduced water infiltration, shading, and bank stability; increased runoff, water velocity, erosion, sediment load, and stream temperatures; lowered water table; and impaired fish and aquatic habitat) would be stabilized. Compliance with the stream bank alteration standard would lessen the floodplain and in-stream trampling impacts and associated resource consequences. The direct sloughing and shearing of stream banks would improve and the erosion rates, and thus sedimentation, would decrease. The secondary impacts associated with stream bank alteration, in the form of increased channel widths and depths, a change in the composition of stream bed materials, a reduction in quality and quantity of stream bank undercuts and pools, would also be either stabilized or improved (Belsky, Matzke, & Uselman, 1999), (Powell, Cameron, & Newman, 2000).

The implementation of Alternative 3 would require consistent and continuous collaboration and response from both the livestock operators and the agency personnel responsible for managing the allotment. Leonard and Karl (1995) contend that both livestock grazing and stream system improvement can be accomplished with an increased emphasis on compliance to suitable grazing systems and practices. Overall, the implementation of this alternative would result in an improvement for the riparian and water resource if the associated terms and conditions (#13) are met. The alternative could result in an improvement for the riparian and water resource (9.2 miles of stream that support riparian vegetation and 250 acres of riparian-wetland area associated with springs) and the Rangeland Health Standards associated with the resources (2, 3, and 7) would be met.

3.5.4.3.4 Alternative 4 Effects

The water and riparian resources are minimal in the Garat allotment, and occur in small areas of pastures 2, 3, 4, 5, and 6 (Maps RNGE-2 through RNGE-6). Under Alternative 4 (for details, see Sections 2.4 and 2.8.2.4), pasture 2 would be grazed in conjunction with pasture 1 during the spring during all 3 years in the 3-year cycle. Pastures 3 through 6 would also be grazed during the spring 1 of the 3 years of the rotation. Spring or early-growing-season grazing would provide rest during much of the riparian area growing period, thereby promoting seed and root production (Powell, Cameron, & Newman, 2000). Riparian vegetation would benefit since regrowth occurs every year and woody plant species browse is minimized. Thus, this system of grazing would benefit the riparian system because both the direct impacts, in the form of vegetation removal, and livestock trampling, as well as the secondary impacts such as detrimental changes in stream morphology, increased erosion and sediment loads, decreased water quality, and impaired fish and aquatic habitat would be reduced. They would be reduced because the grazing would not occur during the more critical riparian area growing season. However, impacts would occur because early-season grazing occurs when soils are typically wet. The static load of a cattle hoof is reported to range from 2.8 to 10.9 kg/cm^2 and can increase by two to four times when the animal travels (Powell, Cameron, & Newman, 2000); thus, when the soils are saturated, the physical damage to the stream banks increase. The increased soil compaction could cause an increase in erosion and sediment loading that would impair water quality and thus fish and aquatic habitat.

Pastures 3 through 6 would be grazed during the summer and fall (7/1 to 10/15) in 2 of the 3 years of the cycle. Because upland grasses are often dry and temperatures are warmer during the summer months, livestock make disproportionate use of riparian areas and riparian herbaceous vegetation is preferred (Powell, Cameron, & Newman, 2000). Additionally, livestock congregate close to water where it is cooler and the forage is more palatable (Liggins, 1999), (Bryant, 1982), (Smith, Rodgers, Dodd, & Skinner, 1992). Once livestock have congregated along floodplains, in riparian-wetland areas, and in the stream channels, further impacts associated with stream bank trampling (Kauffman, Krueger, & Vavra, 1984), soil compaction (Marlow & Pogacnik, 1985), and water quality (Taylor, Gillman, & Pendretti, 1989) occur (Table RIPN-2). In-stream trampling, disturbance and erosion from denuded banks, reduced sediment trapping by vegetation, loss of bank stability, and increased peak flows lead to reduced habitat quality for both fish and aquatic species, reduced infiltration, and lowered water tables (Stevens, McArthur, & Davis, 1992). An increase in soil compaction created by congregated livestock (especially during spring grazing) causes an increase in erosion, decreased water infiltration rates and more runoff, reduced plant productivity and thus less vegetative cover (Clary, 1995). Finally, impacts associated with water quality include a potential increase in nutrient concentrations, bacteria, sediment, and water temperatures. Direct fecal deposition into and near water, runoff from disturbed stream banks, and hoof churn up of contaminated sediments increase nutrient and bacteria concentrations (Taylor, Gillman, & Pendretti, 1989).

Overall, implementation of Alternative 4 that does not allow grazing in the riparian pastures every year during the riparian area growing season would reduce the impacts on the riparian and water resource, and the rangeland health Standards (2, 3, and 7) would be met. Specifically, about 2.5 miles of intermittent streams within pasture 2 would incur only those impacts associated with spring grazing every year, and the 3.65 miles of intermittent stream in pastures 2-4 and 6 would incur impacts associated with spring grazing 1 of every 3 years. Within pastures 3 through 6, 3.65 miles of intermittent stream that support riparian vegetation, and 250 acres of spring riparian area would incur those impacts associated with summer and fall grazing as described above.

3.5.4.3.5 Alternative 5 Effects

Alternative 5 is a no-grazing prescription. The permit to allow livestock grazing on the allotment would not be authorized and grazing would not occur for the duration of 10 years.

The elimination of grazing for a period of 10 years would let the riparian ecosystem restore because the rest from livestock would allow for the recovery of the stream bank and a functional riparian plant community. Information is lacking on the length of rest required for recovery of riparian vegetation; however, shrubs often require longer periods of recovery than herbaceous vegetation (Powell, Cameron, & Newman, 2000). Improvement in stream channel form and function would only occur if the channel is at a stage where improvement is possible; for example, downcut systems would need to reach a new base level and widening would have to occur to allow vegetation establishment sufficient to resist higher flows (Leonard & Karl, 1995). Recovery would also be dependent on the levels of degradation and the climatic variables (Bellows, 2003). Since the allotment occurs in an arid region and the riparian areas accessible to livestock are degraded, 10 years of rest would not generate riparian-wetland areas that historically existed. However, research has found that in ungrazed areas, streams experienced decreased widths and depths (Clary, 1999), vegetation cover increased two-fold, stream bank stability increased by 50 percent (Scrimgeour and Kendall 2002), and stream bank erosion was 3.3 times less in an ungrazed area compared to an area grazed at a moderate stocking rate and level of use (Kauffman, 1982).

The implementation of Alternative 5 would have the greatest benefit for the riparian and water resources because the riparian ecosystem would recover most of the structural and functional diversity that occurs within the allotment.

3.5.4.4 Cumulative Effects

Introduction and Scope

A cumulative effect is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative impacts focus on the aggregate effects of the past, present, and reasonably foreseeable future actions. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within 3 years.

The water and riparian resource CIAA was set to the IDEQ 5th field HUCs (Table RIPN-17, Map CMLV 1) that incorporate and extend beyond the allotment boundary. The watersheds are comprised of assessment units that were established to incorporate groups of similar streams with the same stream order, and with similar land use practices, ownership, or land management. The watersheds that make up the CIAA include Coyote Springs/Owyhee, SF Owyhee River, Juniper Creek, Piute Creek, Yatahoney Creek/Owyhee, and the Red Canyon/ Owyhee River. The BLM chose this CIAA because the direct and indirect effects of grazing management on riparian and watershed resources, as well as on specific impacts such as stream sediment and water temperature, can be felt within this IDEQ 5th field HUCs. Outside of this area, however, direct and indirect effects of the grazing scheme will not be experienced and/or will be too small to create identifiable cumulative effects.

Table RIPN-17: IDEQ 4th and 5th field hydrologic unit codes for the Garat allotment

4th Field HUCs (sub-basins)	5th Field HUCs (watersheds)	Watershed Acres
Upper Owyhee	Juniper Creek	65,364
	Piute Creek	46,071
	Red Canyon-Owyhee River	93,055
	Yatahoney Creek-Owyhee River	99,705
SF Owyhee	Coyote Springs-SF Owyhee	226,437

Cumulative Impact Area Activities

The figures in the following table of past, present, and reasonably foreseeable future actions relevant to cumulative impacts area were calculated using BLM GIS data. The data used represent the best available information and the calculations based on the data are approximate.

Table RIPN-18: Past, present, and foreseeable actions within the Garat allotment CIAA (Idaho only)

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing Allotments	26 active BLM allotments	Permits are renewed/modified as they expire: 6 to be processed by 2015.
Wildfire	113,151 acres (between 1973-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	13,533acres (1981-1983)	9,750 acres
Noxious Weed Presence	54 infestations	Fewer than 10 acres/year of new weed infestation anticipated
Agriculture	48 acres	None
Roads (all are unpaved)	472 miles	None

Livestock grazing is the dominant land use activity in the area, and almost all of the land area is managed for grazing. In the 1990s, BLM initiated a series of range reform activities in response to poor range conditions. Since the Idaho Rangeland Health Standards were implemented in 1997, Idaho BLM has reviewed and issued grazing permits on about half of the available allotments in the general area. The final decisions for these allotments have been implemented to make significant progress toward meeting Standards. Allotments in this area are primarily grazed throughout the spring and summer. Additionally, a variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs, have been implemented across the landscape to aid in livestock grazing management. Allotments that occur completely or in part within the water-riparian resource CIAA and their acreage are shown in table RIPN-19. The allotments in the analysis area are in various stages of the 10-year cycle, and as expiration dates approach, each allotment will be evaluated for rangeland health and progress toward meeting Standards prior to the authorization of a new permit. Overall, past and current grazing in the CIAA has had an adverse effect on riparian and watershed resources because grazing has primarily occurred during the spring and summer months when the riparian area soil and vegetation are most vulnerable. Reasonably foreseeable future grazing is expected to improve the condition of the riparian and watershed at least to make significant progress towards meeting the Idaho Rangeland Health Standards.

Table RIPN-19: Grazing allotments within the Garat allotment CIAA, acres, stream mileage within each, and their permit renewal data

Allotment Name	Acres	Perennial Miles	Intermittent Miles	Year Permit Expires
45	63,601	0.1	160	2018
Bennett	13,247	0	4.6	2017
Big Springs	206,599	0.1	27.3	2019
Black FFR	5,843	0	0.7	2019
Bogus Creek FFR	7,006	0	2.3	2021
Bull Basin	50,271	27.2	64.5	2022
Bull Basin FFR	240	2.0	0.72	2022
Burghardt	19,790	9.7	76.7	2020
Burghardt FFR	3,634	1.0	6.2	2022
Castlehead/Lambert	46,049	17.5	78.5	2014
Garat	211,667	0	46.3	2017
Garat Individual	909	0	5.4	2017
Indian Meadows	19,395	0	7.6	2013
Lone Tree	15,542	0	0	2017
Louisa Creek	10,591	0	0	2017
Moore FFR	850	0	0	2013
Nahas FFR	2,261	0.1	1.7	2022
Nickel Creek	72,690	0	42.7	2014
Nickel Creek FFR	8,521	0	2.2	2014
Pleasant Valley FFR	5,531	2.7	1.4	2022
Riddle	243,470	0	89.5	2019
Swisher FFR	762	0.5	4.9	2020
Tent Creek	3,851	0	82.6	2018
Trout Springs	63,596	3.0	3.2	2012/2017
West Castle Creek	29,224	0	2.9	2019

Wildfire records maintained by the Idaho BLM State Office indicate that 113,151 acres (22 percent of the CIAA) burned between 1973 and 2011within the analysis area. Wildfires have caused disturbances within the watersheds, increasing the potential for overland flows, soil erosion, and increased stream sedimentation. When wildfires have burned and removed riparian vegetation, the compounding impacts such as increased stream temperatures, loss of water infiltration, decreased bank stability, and impaired aquatic species habitat have occurred within the CIAA.

Past, present, and future vegetation treatments such as prescribed fires, juniper, conifer, and sagebrush control, and invasive species control have had limited effects within the allotment. Boise District records indicate that 7,275 acres within the allotment and approximately 13,500 acres within the CIAA have been treated using either prescribed fire or mechanical methods. Additionally, within the CIAA, another 9,750 acres of treatments are planned in the future. Overall, any effects within the watersheds would not be measurable because they do not overlap with the riparian areas and have a localized and small area extent.

Additionally, there are about 48 acres of agricultural land and 54 occurrences of weed infestations documented within the analysis area. The small area impacted by these activities has had no measureable effect on the water-riparian resource either in the Garat allotment or within the larger analysis area because the areas are too small to be meaningful in the CIAA and because they do not overlap with the riparian areas.

Increasing population in the Treasure Valley and an increasing popularity of off-highway vehicles (OHVs) is creating additional pressures on the water-riparian resources from recreation uses. The recent Wilderness and Wild and Scenic River designation is also expected to increase recreation use of this general area. There are approximately 472 miles of unpaved roads traversing the analysis area. The streams that occur within the area are crossed by roads at an estimated 237 different places. Dependent on the amount of traffic that occurs on a given road, the stream crossings increase erosion and sedimentation, and disturb vegetation and aquatic species both on a site-specific scale, as well as downstream of the crossings.

A transportation plan for Owyhee County is expected in the near future which may alleviate some OHV resource concerns because routes would be designated, reducing cross country and unauthorized travel. However, products resulting from travel management, such as maps and signage, are likely to result in increased visitor use, which may increase pressure on the water/ riparian resources.

Current Condition

The streams within the allotment form the headwaters of the larger drainages that define the area include the SF Owyhee River and the Owyhee River. The water/riparian resource cumulative impact analysis area is approximately 530,634 acres, and contains about 58 miles of perennial streams, 1,524 miles of intermittent/ephemeral streams, and 111 springs (Idaho only (USDI USGS, 2011)). There are 202 miles of stream that have not been assessed by the State of Idaho for water quality standards and 322 miles that are water quality-impaired and are not meeting the beneficial uses assigned to the watersheds (Maps RNGE-2 through RNGE-6 (Idaho DEQ)). Beneficial uses are assigned by the IDEQ on a sub-basin scale, and within the CIAA, they include cold water aquatic life, salmonid spawning, and primary and secondary contact recreation (RIPN-21).

Most streams and springs within the analysis area have been influenced by various land use activities, including livestock grazing. Many of the streams within the analysis area, including the SF Owyhee River, are not meeting IDEQ water quality standards, primarily due to high water temperatures and sedimentation. Tables RIPN-20 and RIPN-21 provide an overview and the pollutants of concern for the Upper Owyhee River and the SF Owyhee River sub-basins.

Table RIPN-20: Upper Owyhee Watershed Overview

Hydrologic Unit Code	17050104
Size	1,384,288 acres (total) 1,012,411 acres (in Idaho)
§303(d) Listed Stream Segments	Deep, Pole, Castle, Battle, Shoo Fly, Red Canyon, and Nickel Creeks; Blue Creek and Juniper Basin Reservoirs
Beneficial Uses Affected	Cold water aquatic life, salmonid spawning, primary and secondary contact recreation
Pollutants of Concern	Sediment, bacteria, flow alteration, temperature
Major Land Uses	Rangeland, riparian, forestry, irrigated agriculture

Source: Upper Owyhee Watershed (Idaho DEQ, 2009)

Table RIPN-21: South Fork Owyhee Watershed Overview

Hydrologic Unit Code	17050105
Size	Total: 1,183,923 acres (1,850 square miles) In Idaho: 154,810 acres (242 square miles)
§303(d) Listed Stream Segments	South Fork Owyhee River
Beneficial Uses Affected	Primary contact recreation, secondary contact recreation, cold water biota, salmonid spawning, special resource waters, domestic water supply, agricultural water supply
Pollutants of Concern	Sediment and temperature
Major Land Uses	Livestock grazing

Source: South Fork Owyhee Watershed (Idaho DEQ)

3.5.4.4.1 Alternatives 1& 2 Cumulative Effects

Alternatives 1 and 2 would directly and indirectly effect the Garat allotment in similar ways (see details in Sections 3.5.4.3.1 and 3.5.4.3.2). Both alternatives would continue to degrade the riparian areas because the removal of riparian vegetation, deposition of fecal matter, and livestock trampling would continue.

Furthermore, the associated secondary impacts, including sedimentation, increased water temperatures, lowered water table, and decreased suitability of aquatic species habitat, would also remain the same.

Most of the streams within the analysis area have been affected by past and present livestock grazing because the allotments within the CIAA have and continue to be grazed during the vulnerable riparian area growing season. Under Alternatives 1 and 2, the streams in the Garat allotment will continue to be grazed during the riparian area growing season, and these continued impacts, when combined with those occurring on the other allotments within the analysis area, would continue to alter stream banks because deep-rooted riparian vegetation would be removed and channels would be trampled. Consequently, stream channel morphology would change and erosion would increase, all contributing to the degradation of riparian areas and a decrease in water quality in the allotment and in the watersheds. Additionally, under these alternatives, an increase in livestock AUMs, when added to the current grazing occurring in the adjacent allotments, would further degrade the condition of the water-riparian resources on the Garat allotment and result in an incremental increase in degraded riparian areas in the watershed. Most of the area is grazed during the spring and summer, causing a loss of riparian vegetation cover and reducing bank stability. Continued impacts associated with summer grazing would lead to changes in stream channel shape, structure, and form. A loss of morphological form could lead to a loss of stream and riparian area function (i.e., water infiltration, bank and channel stabilization, aquatic and fish habitat). Overall, the continued degradation expected in the adjacent allotments would add to the continued poor condition of the riparian and watershed conditions within the allotment under either of these alternatives, and the conditions within the CIAA would continue to be degraded.

One of the general impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment and stream temperatures, and thus, less suitable aquatic species habitat. The sediment increase from roads occurs where the roads cross the streams (approximately 407 places), after which, the effect is apparent downstream of the crossings. Thus, the increase in sediment within the CIAA caused by roads currently impacts approximately 40 percent of the streams. However, many of the roads in the Garat allotment are remote, two-track, and are seldom used; thus, the impact is expected to be relatively minor. The sediment increase caused by fires occurs because erosion increases when overland flows increase due to the loss of vegetation. Past fires have overlapped with riparian areas and have impacted about 448 miles of stream (28 percent of the mileage within the CIAA). Since the grazing proposed under the alternatives would contribute to an increase in sediment and stream temperatures, it would add to the sediment increase caused by stream crossings and loss of vegetation due to fires and would contribute cumulatively to the overall impact within the CIAA. Many of the streams within the allotment are ephemeral and only flow for a short time and a small distance, based on precipitation and snowmelt. Thus, the cumulative impact would be small, but when added to the impact from the other area activities, the condition of the riparian areas and watersheds would continue to be degraded.

Overall, under either of these alternatives, the impacts from the proposed action would degrade approximately 500 miles of intermittent/ephemeral streams, along with the associated riparian areas and the water quality within the allotment. When these impacts are added to those of the other area activities, they would add incrementally to and degrade about 58 miles of perennial stream and 1,524 miles of intermittent stream within the larger CIAA. The condition within the CIAA would be impacted by the additive sediment contributions and associated increase in stream temperatures and decrease in suitable aquatic species habitat. Consequently, the resources would continue to be degraded and would not make progress toward meeting Standards under either of the two alternatives.

3.5.4.4.2 Alternative 3 Cumulative Effects

The direct and indirect effects described in Section 3.5.4.3.3 for Alternative 3 would allow sufficient herbaceous and woody vegetation to remain after the growing season to protect the stream banks during high-flow events, allow vegetation to regenerate, and protect riparian soils from physical alterations. When the direct and indirect effects of Alternative 3 are added to the impacts from the other past, present, and reasonably foreseeable future area activates described above, the condition of the streams, springs, and associated riparian-wetland areas within the analysis area watersheds would see an overall small improvement. The improvements in the condition of the streams and springs would lead to increased riparian area function (i.e., increased water infiltration and improved aquatic and fish habitat).

Present and future proposed changes in grazing management (designed to make progress toward meeting Rangeland Health Standards), when added to this action, would improve wetlands and riparian areas by increasing riparian woody and herbaceous communities. As plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the improvements expected within the allotment would be added to those expected within the adjacent allotments to improve riparian area condition within the CIAA. However, the improvements are expected to be insignificant in the larger analysis area.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sedimentation occurs. Additionally, the vegetation is disturbed which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less suitable aquatic species habitat. Many of the roads in the Garat allotment are remote, two-track, and are seldom used; thus, the impact is expected to be relatively minor. Fire directly removes vegetation, increasing the potential for overland flows and erosion; both lead to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a small decrease in sediment and stream temperatures, it would incrementally reduce the sediment increase caused by stream crossings and loss of vegetation due to fires, and would cumulatively reduce the overall impact within the CIAA. However, overall, the reduction in sediment and stream temperatures from both the proposed action and the other area activities is expected to be small and would not be significant in the riparian and watershed condition in the CIAA.

The implementation of Alternative 3 would have a small improvement on the water-riparian resource condition within the allotment and would cumulatively improve the conditions within the analysis area. Specifically, within the CIAA, the condition of the approximately 58 miles of perennial and 1,524 miles of intermittent/ephemeral streams along with the associated riparian areas and the water quality could improve. However, the improvements are expected to be too small to be measurable and would not be significant within the CIAA.

3.5.4.4.3 Alternative 4 Effects

As described above in the direct and indirect effects Section 3.5.4.3.4, Alternative 4 would prohibit summer/growing season grazing in the riparian pastures, which would almost completely eliminate the impacts on the riparian and water resource because the direct removal of riparian vegetation and stream trampling would be minimized to early spring grazing.

Since livestock grazing is the dominant land use activity in the cumulative analysis area, the impacts of Alternative 4, when added to the present and future proposed changes in grazing management (to make progress toward meeting Rangeland Health Standards) occurring in surrounding allotments, would improve the condition of the streams, springs, and associated riparian-wetland areas within the CIAA. The improvements in the condition of the streams and springs would lead to increased function (i.e., increased water infiltration and improved aquatic and fish habitat). An increase in woody and herbaceous communities would occur, and as plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the improvement expected within the allotment would help improve the condition of the riparian areas and watersheds within the CIAA.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sediment occurs. Additionally, the vegetation is disturbed, which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less-suitable aquatic species habitat. The impacts from roads are apparent downstream of the road crossing. Approximately 40 percent of the streams within the CIAA would be subjected to this impact. However, many of the roads in the Garat allotment are remote, two-track, and are seldom used; thus, the impact is expected to be relatively minor. Similarly, fire directly removes vegetation, increasing the potential for overland flows and erosion; both leading to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a decrease in sediment and stream temperatures, it would incrementally reduce the sediment increase caused by stream crossings and loss of vegetation due to fires, and would incrementally reduce the overall impact within the CIAA.

The impacts on the water-riparian resources from the action under Alternative 4 that would occur within the allotment would be added to the impacts from the other areas activities and would cumulatively help improve the conditions within the larger analysis area. Specifically, the condition of the approximately 58 miles of perennial and 1,524 miles of intermittent/ephemeral streams along with the associated riparian areas and the water quality could improve.

3.5.4.4.4 Alternative 5 Effects

The cumulative impacts of Alternative 5 that combine extended rest from livestock grazing and proposed changes in grazing management in adjacent allotments to make progress toward meeting rangeland health Standards would result in greater and faster water-riparian resource improvement than the other proposed alternatives. The impacts would be similar to Alternative 4 because the proposed livestock grazing would move the allotment toward meeting Standards. However, since there would be no livestock grazing, an improvement in the recourses would occur faster (as previously identified in the effects analyses) and similarly, the incremental effects from the various resource improvement would occur at a faster rate.

3.5.5 Wildlife/Wildlife Habitat and Special Status Animal Species

3.5.5.1 Affected Environment

In addition to the general overview of the affected environment for Wildlife Resources in the Owyhee River allotments presented above (Section 3.3.1.5), descriptions of the current condition of species and their habitats within the Garat allotment are based on the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012b) and Determination (Appendix J), affected environments of the Rangeland Vegetation and Water and Riparian Resources within this EA (Sections 3.5.1.1 and 3.5.4.1, respectively), recent personal observations, current element occurrences in IFWIS (IDFG, 2011b), and consultation with local wildlife professionals.

Wildlife Habitat

The entire Garat allotment is located within the Dissected High Lava Plateau Level IV Ecoregions discussed previously (Map WDLF-1; Section 3.3.1.5). Within the allotment, this ecoregion is characterized by relatively flat shrub steppe uplands interrupted by several low rounded buttes (e.g., Whitehorse) and basalt rimmed basins (e.g., Piute, Kimball, Little Horse, Horse, and Juniper)(Map WDLF-1). Wildlife habitats within the allotment are predominantly comprised of sagebrush steppe and grasslands (primarily non-native crested wheatgrass). In addition to the many small intermittent stock ponds scattered across the allotment, several large reservoirs (e.g., Juniper Basin), ephemeral/vernal lakes, and intermittent streams (e.g., Piute Creek) provide limited seasonal riparian habitat (Table WDLF-5; Map WDLF-2). Upland and riparian vegetation within the allotment have been discussed in detail in Sections 3.5.1 and 3.5.4.

Table WDLF-5: Major habitat and general cover types with the Garat allotment

Habitat Type	**General Cover Type**	**Percentage of Allotment**	
		General Cover Type	**Habitat Type**
Grassland	bunchgrass	2	2
Salt Desert Shrub	greasewood	< 1	< 1
	salt desert shrub	< 1	
	sparse vegetation	< 1	
Shrub Steppe[1]	big sagebrush	58	85
	mountain big sagebrush	< 1	
	low sagebrush	27	
Mountain Shrub	bitterbrush	< 1	< 1
	mountain shrub	< 1	
Forest	aspen	< 1	< 1
	juniper	< 1	
Riparian	wet meadow	< 1	< 1
Non-native/Disturbed	exotic annuals	1	12
	rabbitbrush	11	

[1] The spatial data set for general vegetation cover types was prepared by the Pacific Northwest National Laboratory in 2003. These data may be found online or are available from the BLM by request.
[2] Shrub steppe habitat type includes the predominant big and low sagebrush communities in the area. Big sagebrush (*Artemisia tridentata*) cover types include communities dominated by the Wyoming (*Artemisia t. wyomingensis*), Basin (*Artemisia t. tridentata*) subspecies, as well as mixed communities dominated by either subspecies. Low sagebrush (*A. arbuscula*) and mountain big sagebrush (*A. tridentata vaseyana*) cover types comprise the remaining sagebrush communities.

The BLM's 2012 Rangeland Health Assessment and Evaluation for the Garat allotment concluded that the allotment is not meeting Standard 8 for special status wildlife species. The allotment is not meeting Standard 8 because upland habitats and riparian habitats (where present) are not providing the composition, structure, and function necessary for many obligate, dependent, and associated migratory birds and special status wildlife species.

<u>Uplands</u>
In general, uplands within the allotment are not meeting structural and functional habitat requirements for many special status shrub steppe-obligate and -dependent wildlife species, due in large part to current and historical grazing practices, poor post-burn recovery of native plant communities in portions of the allotment, and the overall departure from reference plant community phase conditions of sagebrush steppe habitat in most pastures (although the product of coarse-scale classification, note non-native/disturbed

inclusions Map WDLF-2). Shrub steppe habitats dominated by several species of sagebrush and perennial bunchgrasses that would be expected to occur across the vast majority of the allotment based on ecological site descriptions have the potential to provide vital nesting and foraging habitat for many special status wildlife species. Unlike the other Owyhee River Group allotments, juniper encroachment is not an issue within the Garat allotment. Habitat conditions in the Garat allotment are a combination of man-made and natural forces (i.e., livestock management, wildfire, and natural progression) on the plant community over time. Livestock grazing (historic and current), fire, and land management practices have all contributed to present-day conditions. Several areas that have experienced large historical fires have not demonstrated the proper post-burn recovery that would be expected for the amount of time elapsed (particularly in pastures 4 and 6). These areas are characterized by an overall lack of shrub recovery or dominance by rabbitbrush species (USDI BLM, 2012b). Areas lacking shrubs are dominated by seedings of non-native crested wheatgrass, which does not provide the necessary habitat components for nesting and foraging required by most shrub steppe wildlife species.

Currently, upland habitats throughout the allotment are generally characterized by relatively tall, dense stands of sagebrush composed of columnar individuals with many broken, dead, and dying branches. In addition, healthy, productive, and diverse populations of native perennial grasses (especially tall-statured, deep-rooted bunchgrasses) and forbs are not being maintained within these decadent big sagebrush stands (i.e., dense, monotypic, late seral or climax stands with limited species richness, diversity, and herbaceous cover in an ecologically stable state (Perryman, Olson, Petersburg, & Naumann, 2002)). Upland wildlife habitats in loamy Wyoming big sagebrush ecological sites (i.e., predominantly R025XY019ID and R011XY001ID) (USDA NRCS, 2010) within the allotment have experienced vegetation community transitions within the reference state to a different phase (i.e., Phase B and State 1.2, respectively). These notable departures from what would be expected based upon ecological site descriptions (i.e., tall, deep-rooted perennial grasses like bluebunch wheatgrass versus short-statured, shallow-rooted grasses like Sandberg’s bluegrass; (USDI BLM, 2012b)) are indicative of improper grazing practices (USDA NRCS, 2010). These conditions are particularly evident in pastures 3, 4, 5, and 6, although these issues exist to some degree in all pastures. The absence of shrub structure at various heights affects nesting habitat by reducing nesting substrate and increasing the likelihood of predation. In addition, the absence of native grasses and forbs affects species that are adapted to foraging on seeds and insects in native habitats. Of primary concern is the ability of these sagebrush communities to provide habitat structure (diverse and intersecting overstory/understory interface) and function (nesting, security, and foraging cover) for effective habitat for shrub-obligate and -dependent species such as greater sage-grouse, pygmy rabbits, Brewer’s sparrows, loggerhead shrikes, sage sparrows, and Wyoming ground squirrels.

Riparian

Although very limited in amount and extent within the allotment, riparian/wetland habitats are predominantly accessible to livestock. In general, the majority of ephemeral watercourses that traverse the flat uplands do not support riparian vegetation. However, some stream courses (especially those that drain the large basins) have the potential to support limited woody and herbaceous hydric species. For the most part, these riparian areas lack large trees, although other components that provide structural diversity could potentially provide habitat for some species that are relatively common within the Owyhee River group allotments. Nevertheless, the riparian and wetland habitats that would be expected at these sites are nearly absent as is the diversity of expected riparian-associated wildlife species which includes calliope hummingbirds, willow flycatchers, black terns, and some special status bat species (e.g., fringed myotis, spotted bat, and Townsend’s big-eared bat). Intermittent Piute Creek is located in the north central portion of the allotment (Map WDLF-1), and was assessed as functional-at-risk in pastures 3 and 4. In addition, several springs in pasture 4 were assessed as non-functional (Section 3.5.4.1). The reduced amount of woody and herbaceous hydric vegetation is limiting the amount of nesting structure and cover and foraging habitat that many obligate, dependent, and associated riparian/wetland wildlife species require.

Due to the lack of perennial streams and water sources within the Garat allotment, habitat for many aquatic species (e.g., redband trout, spotted frog, northern leopard frog) is absent.

Focal Special Status Animal Species

Greater sage-grouse

Similar to the Castlehead-Lambert allotment, the majority of the Garat allotment historically provided suitable habitat for sage-grouse and supported significant populations (USDI BLM, 1969). Currently, sage-grouse PPH and PGH occurs throughout the entire Garat allotment (Map WDLF-3). The most recent revision to the PPH model incorporates additional information including a sagebrush component and a restoration potential component (version 2) (Makela & Major, 2012). Within the allotment, PPH includes two subcategories (i.e., sagebrush and perennial grasslands; Table WDLF-6; Map WDLF-6). There are substantial amounts of PGH in areas of historical burns within pastures 3, 4, 5, and 6 (Map WDLF-6). Wildfire has been cited as a substantial threat to sage-grouse habitat (Idaho Sage-grouse Advisory Committee, 2006) primarily due to the loss of sagebrush nesting cover for a considerable period of time (Nelle, Reese, & Connelly, 2000), (Hess & Beck, 2012) and an increased risk of invasion by cheatgrass in low-elevation Wyoming big sagebrush communities (Chambers, Roundy, Blank, Meyer, & Whittaker, 2007).

Table WDLF-6: Sage-grouse habitat acreage within Garat allotment, 2012

Pasture	Preliminary Priority Habitat (PPH)			PGH
	Sagebrush	Perennial Grassland	Total	
1	14856	6	14863	325
2	12673	7482	20155	244
3	39254	304	39559	5017
4	26357	7955	34312	6744
5	32671	172	32843	6183
6	27383	15134	42517	8903
Total (% of allotment)	153195 (72 %)	31054 (15 %)	184249 (87 %)	27416 (13 %)

In general, key habitat components for sage-grouse include an adequate canopy cover of tall grasses and medium-height shrubs for nesting, abundant forbs and insects for brood-rearing, and the availability of herbaceous riparian species for late growing-season foraging (USDI BLM, 2012b). The 2003/2004 sage-grouse breeding habitat assessments identified at various levels issues in sagebrush community composition, structure, and function in all pastures.

Areas of PPH-sagebrush are present in every pasture throughout the allotment (Map WDLF-6). Occupied lekking areas and incidental observations indicate that sage-grouse occur within the allotment throughout the year ((IDFG, 2011b) BLM, unpublished data). This information suggests that most seasonal habitats are potentially present in the allotment including breeding, nesting, brood-rearing, and wintering habitats. Nesting and wintering areas have the potential to be abundant and occur throughout the allotment in appropriate sagebrush habitats. However, brood-rearing areas are probably the most limiting seasonal habitat type because riparian vegetation along water courses and natural wetlands are limited in amount and extent within the allotment. Most female sage-grouse and older chicks probably seek areas within deeper swales where slope and aspect are favorable for maintaining succulent herbaceous vegetation late into the summer or move east to known brood-rearing concentrations areas (i.e., Blue Creek, Duck Valley Reservation; (Wik, 2002)).

The majority of pastures 1 and 2 is comprised of PPH-sagebrush (Map WDLF-6). Although a substantial portion of pasture 2 (approximately 37 percent) is classified as PPH-perennial grasslands (Table WDLF-6; Map WDLF-6), recovery of the native plant community is occurring ((USDI BLM, 2012b) p. 32). These pastures provide breeding habitat in continuous stands of big sagebrush as well as scattered inclusions of big sagebrush within low sagebrush communities. Overall, breeding habitat conditions within these pastures are currently rated as suitable ((USDI BLM, 2012b) p. 65-68). However, of concern in the overstory is the mixed spreading/columnar growth form of sagebrush that exposes the understory. Perennial herbaceous vegetation height in pastures 1 and 2 ranged from less than 5 to greater than 7 inches and averaged greater than 7 inches overall. Although the growth form of big sagebrush in general was not optimal, the effect of this condition appears to be minimized by the occurrence of suitable perennial herbaceous vegetation height and perennial grass canopy cover in the understory.

Brood-rearing habitat in pastures 1 and 2 is limited to the lower reaches of Piute Creek, three relatively large vernal lakes/playas, and shallow swales that direct ephemeral water courses into various small reservoirs and the East Fork Owyhee River Canyon during spring run-off (Map WDLF-6). Piute Creek, the vernal lakes/playas, reservoirs, and these swales retain mesic conditions for brood-rearing habitat longer than surrounding upland areas in pastures 1 and 2 ((USDI BLM, 2012b) p. 14-15). The conditions of brood-rearing habitat along Piute Creek, the margins of reservoirs and vernal lakes/playas, and bottoms of swallow swales within pastures 1 and 2 have not been formally assessed. However, observations in 2011 of some of these features confirm the potential for succulent herbaceous vegetation to occur after the growing season, but also show the presence of abundant weed species (USDI BLM, unpublished data). Brood-rearing habitat in pastures 1 and 2 is supplemented by riparian and flooded areas in pastures 3 and 4 on the middle reaches of Piute Creek and Piute Bain Reservoir (Map WDLF-6).

Pastures 3 and 4 also are comprised primarily of PPH-sagebrush (Map WDLF-6). A minor portion of pasture 3 is classified as PPH-perennial grasslands (Table WDLF-6), whereas approximately 19 percent of pasture 4 falls in the PPH-perennial grasslands category (Table WDLF-6; Map WDLF-6). Both pastures also have areas of PGH (approximately 11 and 16 percent in pastures 3 and 4, respectively; Table WDLF-6; Map WDLF-6). Within areas classified as PPH-sagebrush, relatively large continuous stands of big sagebrush provide breeding habitat in pasture 3. On the other hand, PPH-sagebrush in pasture 4 is characterized by scattered inclusions of big sagebrush within low sagebrush communities. The sizeable area of PPH-perennial grassland in pasture 4 contains a mixture of remnant crested wheatgrass seedings and shrublands dominated by rabbitbrush species ((USDI BLM, 2012b) p. 40). Overall, breeding habitat conditions within these pastures are predominantly rated unsuitable ((USDI BLM, 2012b) p. 70-76). Unsuitable sage-grouse breeding habitat conditions identified at sites in pasture 3 are due to the combination of marginal sagebrush canopy cover (greater than 25 percent) and growth form in the overstory, in conjunction with unsuitable perennial herbaceous vegetation height (averaging slightly more than 5 inches) and perennial grass canopy cover in the understory ((USDI BLM, 2012b) p. 70-73). Average perennial herbaceous vegetation height in pastures 3 ranged from fewer than 5 to greater than 7 inches in a year that the pasture was rested. In contrast to the excess of sagebrush canopy cover in pasture 3, an unsuitable average sagebrush canopy cover of less than 10 percent and marginal perennial herbaceous vegetation heights exist in pasture 4 ((USDI BLM, 2012b) p. 73-74). The 1985 wildfire in pasture 4 (followed by no rest from livestock grazing) has contributed to the current depressed vegetation community conditions and unsuitable sage-grouse breeding habitat conditions in the burn area. Unburned sites in pasture 4 were characterized by excessive average sagebrush canopy cover similar to pasture 3 ((USDI BLM, 2012b) p. 73-76) and average perennial herbaceous vegetation heights ranging from greater than 6 inches to greater than 11 inches and averaging slightly more than 8 inches overall. Pastures 3 and 4 have sites that do not provide suitable sage-grouse breeding habitat. A variety of changes in sage-grouse breeding habitat would have to occur to improve condition in Pastures 3 and 4. Sagebrush canopy cover needs to increase in some locations and decrease in others. Sagebrush growth form in many locations is columnar and does not appear to be providing the proper nest screening to protect sage-grouse from predators. In addition, substantial changes in increased perennial vegetation height and canopy cover would be necessary. From all indicators, it appears that improvements to sage-grouse breeding habitat in pastures 3 and 4 would require an ecological transition that would convert the deteriorated and decadent habitat to an earlier seral state.

Brood-rearing habitat in pastures 3 and 4 includes riparian and flooded areas on the middle reaches of Piute Creek and Piute Basin Reservoir, and shallow swales that direct ephemeral water courses into various small reservoirs and the South and East Forks of the Owyhee River during spring run-off (Map WDLF-6). Piute Creek, Piute Reservoir, other small reservoirs, and these swales retain mesic conditions for brood-rearing habitat longer than surrounding upland areas in pasture 3 and 4 ((USDI BLM, 2012b) p. 16-17). The conditions of brood-rearing habitat at many of the small reservoirs and the bottoms of swallow swales within pastures 3 and 4 have not been formally assessed. However, PFC assessments conducted on Piute Creek in pastures 3 and 4 rated as FAR, while two reservoir/springs in pasture 4 were rated as NF with caveats (Section 3.5.4.1; (USDI BLM, 2012b) p. 27-28). In addition, observations in 2011 of Piute Basin Reservoir in pasture 3 and along Piute Creek in pasture 4 confirm the potential for succulent herbaceous vegetation to occur after the growing season, but also show the presence of abundant weed species. General observation at these features also revealed that vegetation utilization levels ranged from slight to heavy (USDI BLM, unpublished data).

The majority of pastures 5 and 6 is comprised of PPH-sagebrush (Map WDLF-6). A very minor portion of pasture 5 is classified as PPH-perennial grasslands (Table WDLF-6), whereas approximately 29 percent of pasture 6 falls in the PPH-perennial grasslands category (Table WDLF-6; Map WDLF-6). Both pastures also have areas of PGH (approximately 16 and 17 percent in pastures 5 and 6, respectively; Table WDLF-6; Map WDLF-6). These pastures provide breeding habitat in relatively continuous stands of big sagebrush within PPH-sagebrush areas. The sizeable portions of the PPH-perennial grasslands in pasture 6 have largely been recolonized by native species; however, portions of these areas also contain a mixture of remnant crested wheatgrass seedings and shrublands dominated by rabbitbrush species ((USDI BLM, 2012b) p. 48). Overall, breeding habitat conditions within these pastures are currently rated as marginal ((USDI BLM, 2012b) p. 76-81). Perennial herbaceous vegetation height in pastures 5 and 6 ranged from 5 to 8 inches and averaged just less than 6 inches overall. A marginal habitat rating suggests that there are specific or a mix of disconnected habitat indicators in vegetation composition, structure, and function that are a concern associated with the effectiveness of the overstory/understory to provide nesting and security cover. In general, average sagebrush canopy cover was excessive, and average perennial herbaceous vegetation heights and canopy covers were inadequate, and forb abundance and diversity were limited ((USDI BLM, 2012b) p. 76-81). With improved grazing management pastures 5 and 6 may have potential to progress toward a healthier and more desirable habitat condition. Pastures 5 and 6 would improve for sage-grouse if perennial herbaceous vegetation were taller and provided more concealment cover for nesting.

In addition many shallow swales, brood-rearing habitat in pastures 5 and 6 includes the ephemeral drainages at the bottoms of several large basins (i.e., Little Horse, Horse, and Juniper; Map WDLF-1). These drainages harbor many small and a few large reservoirs (i.e., Homer Wells and Juniper Basin Reservoir; Map WDLF-6). Homer Wells Reservoir, Juniper Basin Reservoir, small reservoirs, drainage basin bottoms, and shallow swales above the basins retain mesic conditions for brood-rearing habitat longer than surrounding upland areas in pasture 3 and 4 ((USDI BLM, 2012b) p. 19-20). The conditions of brood-rearing habitat at these features within pastures 5 and 6 have not been formally assessed. Similar to the other pastures, these features have the potential for succulent herbaceous vegetation to occur after the growing season.

Although a variety of issues exist regarding nesting and brood-rearing habitat, the Garat allotment provides abundant winter habitat. Past and current canopy cover and height measurements of sagebrush indicate suitable conditions in all pastures ((USDI BLM, 2012b) p. 65-80).

A native vegetation community of healthy, productive, and diverse populations of native plants typically provides proper habitat composition, structure, and function for effective sage-grouse habitat conditions. As an indicator species for the sagebrush ecosystem, the conditions that specify healthy habitat for sage-grouse are indicative of the health of the system in general. Effective sage-grouse habitat is closely related to vegetation community conditions discussed in Standard 4 (Native Plant Communities). Vegetation communities have shifted from the site potential of co-dominance by deep-rooted perennial grasses to a greater dominance by sagebrush species or shallow-rooted bunchgrasses due to historic grazing and fire (in addition to exotic annual grass dominance in portions of pastures 5 and 6). This vegetation progression to shallow-rooted bunchgrasses, although meeting Standard 4 (Native Plant Communities) for adequate nutrient cycling, energy cycling, and hydrologic cycling, is counter to the development of effective sage-grouse habitat conditions. The downward trend of perennial bunchgrasses in pasture 4 has also led to unsuitable habitat conditions for sage-grouse. In addition to the results of historic grazing and fire, current livestock management is constraining herbaceous vigor and annual production of larger bunchgrasses in the understory, thereby favoring an increased occurrence of smaller bunchgrasses and annuals (Section 3.5.1.1). The extent of the poor habitat conditions in pasture 3, 4, 5, and 6 prevents the allotment from meeting the minimal habitat conditions required by sage-grouse. Any attempts to improve habitat conditions through grazing management or vegetation manipulation would require a long-term strategy. Although deferring use during the critical spring herbaceous growing period can advance understory vegetation vigor and production to improve nesting and early-brood rearing habitat conditions, change, especially to the essential sagebrush component, would occur slowly and take a substantial amount of time.

At least two occupied leks are known to occur within the allotment. These leks are located in pastures 1 and 5 and both were active in 2012 (Map WDLF-3; Table WDLF-3). In addition, the allotment is located within the 75 percent BBD buffer (4 miles) of nine additional occupied leks (Table WDLF-3). The 75 percent BBD buffer is highly correlated to breeding habitat surrounding the lek and corresponds to the high abundance (or population) component of PPH (Makela & Major, 2012). Because counts at these leks have only recently been conducted with any regularity via helicopter 1 day annually, long-term trends in lek attendance includes an unknown and possibly high degree of uncertainty and should be avoided.

Table WDLF-7: Attendance at occupied leks[1] in or within four miles of the Garat allotment, 2007-2012

Lek	**Location**	**Survey Year[2]**					
		2012	**2011**	**2010**	**2009**	**2008**	**2007**
2O466	Pasture 1	5*	8	12	6	--	43
2O264	Pasture 5	10	19	12	--	--	30
2O810	<0.4 miles E	--	--	--	21	16	33
2O656	<1.3 miles E	--	45	41	--	0	--
2O617	<2 miles N	43*	58	6	14	--	24
2O228	<2.5 mile N	41*	35	51	--	--	16
2O220	<3 mile NE	--	--	42	--	0	--
2O701	<3.3 miles W	1**	31	45	28	--	34
2O818	<3 miles W	19*	27	40	--	--	--
2O320	< 3 miles NW	78	--	49	--	28	--
DES-021 (NV)	< 3 miles SW	--	--	25	--	--	25

[1]A traditional display area where two or more male sage-grouse have attended in two or more of the previous five years (ISAC 2006).

[2]Surveys were not conducted in years indicated by dashes (--). Single asterisk (*) denotes unfavorable conditions (i.e., rain) and double asterisk (**) denotes predator on lek also during survey.

As discussed above, the majority of suitable nesting habitat conditions for sage-grouse currently occurs within pastures 1 and 2. Nesting efforts within pasture 1 would likely result from sage-grouse attending lek 2O466. Although nesting conditions are rated as marginal, nesting efforts within pasture 5 would likely result from sage-grouse attending lek 2O264. Although nesting effort within the allotment could result from sage-grouse attending nearby leks outside of the allotment, most nesting sage-grouse probably are attending leks in pastures 1 and 5. It is possible however, that undiscovered leks exist within the allotment. Systematic ground and aerial lek searches have not occurred within the last decade, if ever. In the absence of deliberate systematic lek searches, the probability of incidental discovery of leks is extremely low due to the allotment's remote location and logistical constraints involved with access in the early spring. Because the majority of leks are located north of the East Fork Owyhee River or west of the South Fork Owyhee River, the use of the Garat allotment by sage-grouse attending those leks may be restricted by the predation risk incurred by flying over the canyon.

Pygmy Rabbit

A coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests that portions of all pastures within the allotment have a moderate likelihood of core habitat presence (Map WDLF-4). Habitat in the majority of the allotment is suitable for pygmy rabbits and has the appropriate cover type the species prefers (i.e., big sagebrush and friable soils; Table WDLF-4). Suitable sagebrush habitat and soils predominantly occur within pastures 1, 3, 5, and 6. Pastures 2 and 4 are characterized by shallow, clayey soils and rock outcrops, and suitable loose, friable soils are limited. In addition, big sagebrush habitat is limited in pasture 4 due to the lack of appropriate post-burn recovery, which has not led to the proper vegetation communities the species prefers. A few pygmy rabbit surveys have been conducted throughout the allotment; however, no pygmy rabbits have been documented, and surveys have not revealed evidence of presence (e.g., individuals, burrows, pellets).

Migratory Birds, Raptors, and other Birds (including Special Status Species)

In addition to the general discussion of migratory birds, raptors, and other bird species and their habitats in Section 3.3.1.5, a variety of bird species have the potential to occur or have been documented within and in the vicinity of the Garat allotment (Appendix L). The few areas of riparian habitat in the allotment probably have a limited diversity of species. Riparian-obligate species like yellow warbler may be present, but the limited amount of woody vegetation limits nesting structure and cover for many other dependent species.

Like the other Owyhee River group allotments, shrub steppe habitats dominated by several species of sagebrush and perennial grasslands provide vital nesting and foraging habitat for obligate species, such Brewer's and sage sparrows, and dependent species, including loggerhead shrike and sage thrasher. Direct loss, fragmentation, and degradation of sagebrush habitats connected with the spread of invasive plants, altered disturbance regimes, and the associated state transitions from stable native vegetation communities are some of the most important factors affecting long-term and regional population dynamics of these species (Knick & Rotenberry, 1995) (Knick & Rotenberry, 2000) (Knick & Rotenberry, 2002) (Knick, et al., 2003) (Knick, Holmes, & Miller, 2005). Passerine species like vesper sparrow, horned lark, western meadowlark, and rock wren, and raptors such as golden eagle, prairie falcon, ferruginous and rough-legged hawks, and burrowing and short-eared owls have also been documented in the area's shrub steppe vegetation communities.

Although limited in number, ponds provide foraging habitat for killdeer, spotted sandpiper, Wilson's phalarope, and white-faced ibis. Juniper Basin Reservoir provides abundant stopover habitat for migrating waterfowl. Piute Basin Reservoir and the limited ephemeral wetlands may provide nesting substrate and cover for red-winged blackbird, song sparrow, and Wilson's snipe. In addition, open wetlands with abundant flying insects are important foraging areas for aerial foragers such as black terns, barn, tree, and violet-green swallows. Raptor species associated with water such as bald eagles, osprey, and peregrine falcons have been documented in the area during migration and winter.

Big Game and other Mammals (including Special Status Species)

In addition to the general discussion of big game and other mammal species and their habitats in Section 3.3.1.5, various big game and special status mammal species use a variety of habitats in the Garat allotment for some or all of their seasonal needs. Big game species including elk, mule deer, pronghorn, and California bighorn sheep occur within the allotment throughout the year. The majority of the allotment is located within the IDFG game management unit 42; the eastern portions of pastures 4 and 6 are located in GMU 41.

California bighorn sheep occur within portions of pastures 1, 2, 3, 4 and 5 and in the canyons of the East and South Forks Owyhee River Canyons (Map WDLF-4). Based on occurrence records it does not appear that bighorn sheep venture into the adjacent uplands more than a quarter mile from the canyon rims. Generally these same use areas in pastures 1, 2, 3, 4 and 5 are part of the designated Owyhee River Bighorn Sheep Habitat Area ACEC (Map ACEC-1). Approximately 60 percent (9,080 acres), 53 percent (10,912 acres), 20 percent (8,764 acres), 25 percent (10,234 acres), and 25 percent (9,693 acres) of pastures 1, 2, 3, 4 and 5, respectively, are part of the 141,796-acre ACEC. In addition, IDFG has identified areas along Piute Creek up to Piute Basin Camp in pastures 2 and 4 as bighorn use areas (Map WDLF-4). Although very little use in this area has been documented based on occurrence records, bighorn sheep may use areas along the small canyon formed by Piute Creek in pasture 2 to access the uplands and limited riparian vegetation along the drainage.

The uplands and canyons provide abundant habitat for elk and mule deer. Although mule deer may be present year-round within the allotment, most winter habitat occurs at lower elevations in the nearby canyons of the Owyhee River and its tributaries. Elk also frequent the uplands in the western portion of the allotment, primarily along the South Fork Owyhee River. Elk typically winter at lower elevations in Oregon and Nevada. Pronghorn use within the allotment is extensive. The generally flat to gently rolling terrain provides important and abundant year-round habitat, and the allotment provides large areas of open, windswept country with nearly unobstructed views in all directions, which allows pronghorn to detect predators at a distance.

The geographic distributions and preferred habitats of several other special status mammal species including the dark kangaroo mouse, little pocket mouse, kit fox, and Piute and Wyoming ground squirrels occur within the allotment and in the vicinity. Because the allotment is located at the northern extent of these species' ranges, occurrence within suitable lower elevation habitats is possible.

3.5.5.1 Direct and Indirect Effects

3.5.5.1.1 Alternative 1 Effects

Because the livestock grazing that has occurred under Alternative 1 has led to the current condition for upland and riparian wildlife habitats, it will serve as the baseline for comparison to the other alternatives. Current grazing management has resulted in vegetation communities that lack the full complement of dominant perennial bunchgrasses and shrubs which has reduced cover and forage for wildlife in upland shrub steppe habitats (Sections 3.5.1.2.1). Continuation of growing season use in 2 out of 3 years in pastures 1, 2, 3, and 4 would continue to degrade shrub steppe habitats and decrease vegetation that special status shrub-obligate species such as sage-grouse, pygmy rabbit, Brewer's and sage sparrows, and other wildlife use for nesting substrate, cover, and foraging habitat. Shrub steppe habitats have departed substantially from what is expected based on ecological site descriptions within most of the pastures in the allotment. Big sagebrush stands in many areas are decadent, and individual shrubs are characterized by columnar form with many dead and broken branches. Tall-statured, deep-rooted bunchgrasses that are a desirable component of many wildlife species habitat requirements are mostly absent, having been replaced by undesirable low-statured, shallow-rooted *Poa* species and exotic annual invasive species like cheatgrass. An excessively tall shrub canopy, in combination with a disproportionately short herbaceous understory, does not provide the necessary nesting and foraging cover required by sage-grouse and many other shrub steppe wildlife species. Riparian habitats are minimal in the Garat allotment (Section 3.5.4.3.1). Short reaches of intermittent streams occur in pastures 2, 3, 4, and 6, and woody species and herbaceous vegetation is extremely limited and simple, and currently does not provide the structure riparian-obligate and -dependent species require for nesting and foraging. Habitat conditions for many shrub-obligate species are not expected to improve, and significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would not occur due to the continuation of frequent grazing during the active growing season in the uplands.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Direct and indirect effects of livestock grazing to sage-grouse and their habitats potentially include trampling of eggs and subsequent nest desertion, degradation, loss, and avoidance of formerly suitable habitat caused by lack of adequate sagebrush and perennial herbaceous vegetation cover, and introduction of non-native weeds. Under Alternative 1, effects of spring livestock grazing on sage-grouse and their habitat in pastures 1, 2, 3 and 4 that have the potential to occur include trampling of eggs, nest desertion, and continuation of habitats that have departed substantially from what is expected based on ecological site descriptions. Unsuitable breeding habitat would persist in parts of pastures 3 and 4 due to the continuation of inadequate perennial herbaceous cover and excessive sagebrush height and canopy cover, which do not provide adequate nest concealment from predators during the breeding season. Under Alternative 1, breeding habitat in pastures 5 and 6 would continue to experience a similar deficiency in habitat components as those mentioned for pastures 3 and 4, but to a lesser magnitude, and would remain in a marginal state. Negative effects to upland sage-grouse habitats throughout the allotment would be expected to continue throughout the term of the permit.

Grazing management in sage-grouse habitat should include the long-term objective of promoting desirable plant communities and the annual objective of retaining a standing crop that adequately provides cover for sage-grouse (Cagney, et al., 2010). General grazing management recommendations for nesting and early brood-rearing habitats includes maintaining the sagebrush/bunchgrass plant community wherever present, managing for high vigor in all plant communities, avoiding repeated use of bunchgrasses during the critical growing season, and limiting utilization to moderate levels to assure that the previous year's standing crop is available as hiding cover (Cagney, et al., 2010).

Specifically, current scientific literature identifies adequate canopy cover of sagebrush and tall grasses for nesting, abundant and diverse forbs and insects for brood rearing, and access to succulent and herbaceous riparian vegetation for summer foraging as critical components of healthy sage-grouse habitats (Crawford, et al., 2004). Greater sagebrush and herbaceous cover provides vertical and horizontal concealment of nests from predators and has been demonstrated to result in higher nest success (Connelly, Wakkinen, Apa, & Reese, 1991) (Gregg, Crawford, Drut, & DeLong, 1994) (DeLong, Crawford, & Delong, Jr., 1995) (Moynahan, Lindberg, Rotella, & Thomas, 2007) (Coates & Delehanty, 2010). In general, these studies observed that perennial herbaceous cover at successful nests averaged over 7 inches in height. Based on these and other studies, current guidelines recommend managing breeding habitats to support perennial herbaceous vegetation averaging more than 7 inches in height at the end of the nesting period (Connelly, Schroeder, Sands, & Braun, 2000), and residual grass heights more than 4 inches at the beginning of the nesting season (Hausleitner, Reese, & Apa, 2005) (Holloran, et al., 2005).

Under Alternative 1, perennial herbaceous vegetation heights are expected to average between 6 and 8 inches at the beginning and end of the nesting season in pastures 1 and 2, based on data collected within the allotment in 2003 and 2004 ((USDI BLM, 2012b) p. 65-69). Average perennial herbaceous vegetation heights of fewer than 7 inches that could result from grazing under Alternative 1 would only provide marginal nesting cover in 2 out of the 3 years that pastures 1 and 2 would be grazed. Average perennial herbaceous vegetation heights would likely be taller during years that the pastures were rested, which would provide better nesting habitat conditions periodically. Additionally, perennial herbaceous vegetation heights are expected to average between 5 and 8 inches at the beginning and end of the nesting season in pastures 3 and 4, based on data collected within the allotment in 2003 and 2004 ((USDI BLM, 2012b) p. 70-76). Unlike pastures 1 and 2, average perennial herbaceous vegetation heights of less than 7 inches and as low as 5 inches that could result from grazing under Alternative 1 would only provide marginal nesting cover or worse in 2 out of the 3 years that pastures 3 and 4 would be grazed. However, average perennial herbaceous vegetation heights could exceed 7 inches in pasture 4 routinely or in both pastures during years when they were rested, which would periodically provide taller average perennial herbaceous vegetation heights and better nesting habitat conditions.

Lastly, perennial herbaceous vegetation heights are expected to average 6 inches in pasture 5 and greater than 5 inches in pasture 6 at the end of the nesting season based on data collected within the allotment in 2003 and 2004 ((USDI BLM, 2012b) p. 76-81). As mentioned above, average perennial herbaceous vegetation heights of fewer than 7 inches and as low as 5 inches that would result from grazing under Alternative 1 would provide marginal nesting cover or worse annually. Considering that these data were collected after the growing season in pasture 5, and that an average perennial herbaceous vegetation height of 6 inches was measured in pasture 5 with more than 40 days of regrowth after cattle had been removed from the pasture (actual use records indicate that pasture 5 was grazed from March 16 to May 15 in 2003 after a year of rest), nesting cover as measured by average perennial herbaceous vegetation height would be inadequate before and after the nesting season on an annual basis. On the other hand, it is possible that average perennial herbaceous vegetation heights would exceed 7 inches in pasture 6. Because grazing is deferred in pasture 6, it is possible that the average perennial herbaceous vegetation height of 5 inches (which was measured in mid-May) could have attained the 7-inch threshold with more than 40 days of regrowth remaining. However, based on the same data, it is unlikely that average perennial herbaceous vegetation heights of 4 inches at the beginning of the following nesting season would result after more than 100 days of planned summer/fall grazing.

Current scientific literature also suggests that a healthy and vigorous herbaceous understory of native perennial bunchgrasses is closely associated with sage-grouse productivity (Crawford, et al., 2004) (Hagen, Connelly, & Schroeder, 2007). Thus, some researchers recommend that certain grazing utilization limits be placed on pastures with sage-grouse habitat to ensure long-term productivity of bunchgrasses (Braun, 2006). It is unlikely that sage-grouse select habitat based on utilization levels, much less even perceive it. Because percent utilization of vegetation is dependent on a variety of factors (e.g., species, annual growing conditions, differences in observers and methods), the concept is independent of and uncorrelated to the actual structural and physical properties of the plants on which sage-grouse most likely are selecting for. However, utilization can be a useful tool in managing for the health of native perennial bunchgrasses in the short and long term.

A review of the literature suggests that 40 to 45 percent utilization (i.e., moderate, *sensu* (Holechek, Baker, Boren, & Galt, 2006)) will maintain the health and vigor of bunchgrasses and other rangeland vegetation, and 30 to 35 percent utilization (i.e., conservative, *sensu* (Holechek, Baker, Boren, & Galt, 2006)) is needed to improve the health and vigor of bunchgrasses and other rangeland vegetation (Holechek, Gomez, Molinar, & Galt, 1999). Under Alternative 1, levels of utilization are expected to be consistent with documented levels that on average have ranged from 22 to 37 percent utilization by pasture (Appendix B, Table B-5). Under similar stocking rates and utilization up to moderate to heavy levels some years, perennial bunchgrass and rangeland vegetation are not expected to improve and could possibly deteriorate over the term of the permit. Because rangeland vegetation in the allotment is not improving (Section 3.5.1.2.1), current utilization levels are inadequate and lower use levels (slight) or other changes in grazing management are needed to affect recovery for sage-grouse and other sagebrush-obligate species.

In the past 3 to 5 years, one advocacy group has demanded that BLM abide by the recommendations of one particular sage-grouse expert, Dr. Clait Braun, although this same author has previously acknowledged that there is scant evidence correlating sage-grouse population levels with grazing practices (Connelly & Braun, 1997). In an unpublished and non-peer reviewed document, Dr. Braun advocates a maximum of 30 percent utilization in sage-grouse habitats (Braun, 2006). In addition, Dr. Braun recommends that grazing should not be permitted in sage-grouse habitat during the breeding season (mid-April to early- to mid-June) (Braun, 2006). Although Dr. Braun's utilization recommendations are designed to achieve adequate breeding and concealment cover and to ensure the long-term health of native bunchgrass communities, BLM has decided that perennial herbaceous vegetation height is a more accurate, consistent, and repeatable measure of determining adequate cover than subjective percent utilization levels. Regardless, under Alternative 1, BLM would implement a utilization limit of 50 percent, which would not maintain or improve the health and vigor of bunchgrasses and other rangeland vegetation.

With respect to excluding grazing in sage-grouse habitat during the breeding season, there is little evidence in the scientific literature to support Dr. Braun's proposal that grazing should be prohibited until after June 20. Although the trampling of eggs and nests by livestock, and subsequent displacement and nest abandonment, have been documented (Coates, Connelly, & Delehanty, 2008), these direct effects are rare and isolated, and more than likely have a negligible influence on population levels. Alternatively, the grazing effects associated with the long-term health of native plant communities and the relationship between herbivory and the removal of cover has been shown to be the important and relevant issues affecting sage-grouse and their habitats. Improving juvenile survival rates by increasing the quantity and quality of early brood-rearing habitat as suggested by Connelly and Braun (1997) appear to have more influence on sage-grouse populations than other factors related to overall reproductive success (i.e., nest success and breeding success) (Aldridge & Brigham, 2001) (Aldridge & Brigham, 2002). Accordingly, while prohibiting grazing during the breeding season may reduce some impacts to sage-grouse and their habitats, it is not required to ensure juvenile survival and increases in sage-grouse populations.

Because implementation of Alternative 1 does not institute any practical measures for the conservation of sage-grouse (such as requiring suitable perennial herbaceous cover, which has been shown to increase nesting success and juvenile survival) or other special status species, this alternative is not consistent with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Pygmy rabbit

Under Alternative 1, the condition in upland habitats is not expected to improve due to continuation of current livestock grazing management; therefore, big sagebrush cover and forage for pygmy rabbits would remain similar to current conditions. Habitat conditions for pygmy rabbits would remain poor, as excessively tall sagebrush without an adequate understory would not provide protective cover. The effects of grazing under Alternative 1 would continue habitat deterioration for many small to medium herbivores including pygmy rabbits. Because small and medium herbivores, including pygmy rabbit, play an important role in predator-prey relationships, actions that reduce numbers of these species can have cascading effects to the food web.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Grazing management under Alternative 1 is not expected to improve bird habitat conditions in the uplands. Shrub steppe habitats would remain in a degraded condition for many bird species in the allotment, including special status species such as Brewer's and sage sparrows and loggerhead shrikes. Birds do generally respond, not to the presence of grazing livestock, but to the effects on vegetation from grazing (Bock & Webb, 1984). Improper livestock grazing can cause a decline in habitat for bird species by altering vegetative structure and habitat complexity, reducing cover, diversity, native vegetation, and forage, and spreading weeds and undesirable annuals. The loss of shrub structure at various heights affects nesting habitat and increases the likelihood of predation. The loss of grasses and forbs affects species that forage on seeds and insects.

Effects of grazing on raptors would mainly result from effects to habitat of prey species. Conditions for prey species in upland habitats are not expected to improve from current conditions and prey species populations more than likely would remain relatively static or decline due to continued habitat degradation under Alternative 1. Reduced numbers of prey can influence reproductive efforts and success of raptors. For instance, golden eagles lay fewer eggs or do not breed during years when jackrabbit numbers are low and lay more eggs and produce more young when jackrabbit numbers are high (Steenhof, Kochert, & McDonald, 1997). Although livestock may disturb or trample ground nests of northern harriers and short-eared owls, these incidents more than likely would be rare and isolated under the stocking rates of Alternative 1. Burrowing owls might be disturbed by cattle, but their nests are protected from trampling by being deep in burrows, and effects to reproductive success due to the effects of livestock grazing would be negligible.

Big Game and other Mammals (including Special Status Species)

The proposed timing and level of grazing under Alternative 1 would not improve conditions in the uplands for big game and mammals. In general, livestock grazing is a competitive action with other herbivores that reduces available forage and reduces cover and habitat structure needed by smaller herbivores (Medin & Clary, 1989) (Schulz & Leininger, 1990) (Hayward, Heske, & Painter, 1997). Effects of livestock grazing on big game and mammals under Alternative 1 would include reduced amounts of forage (e.g., grasses, forbs), browse (e.g., sagebrush, bitterbrush), and protective cover. These effects could lead to lower winter survival due to a reduction of high-quality forage that deer and elk require in order to build up winter fat reserves. A reduction in cover could expose deer fawns and elk calves to greater predation and increase mortality rates. In addition, population numbers for deer and elk probably have been affected to some degree by poor habitat conditions due to historic grazing practices. Because elk have the competitive advantage over mule deer, effects to deer populations probably would be greater (Mule Deer Working Group, 2004).

Under Alternative 1, habitat conditions for bighorn sheep would most likely remain similar to current conditions because upland habitat are not expected to improve over the term of the permit. Additionally, because bighorn sheep typically select habitats in rugged terrain and on steep slopes within the canyons adjacent to the allotment, there is very little spatial overlap and resource competition with cattle. Grazing management under Alternative 1 is expected to have negligible effects on the local bighorn sheep population and their canyon habitats.

3.5.5.1.2 Alternative 2 Effects

An increase in the level of livestock use in comparison to Alternative 1 as proposed in the permittee's application would reduce forage and cover for wildlife in uplands, lead to reduced numbers and vigor of native plant species from consumption and trampling, and allow invasive plant species to outcompete native species due to reduced vigor in the latter (Sections 3.5.1.2.2). Habitat conditions for wildlife populations in the allotment would deteriorate in comparison to Alternative 1 because all pastures would be grazed during the growing season (frequently during the critical growing season), and although limited in extent, riparian areas would be grazed during the hot season. These factors deteriorate wildlife habitats because they decrease the ability of native plant communities to remain healthy, vigorous, and productive, and provide adequate forage and cover for wildlife species. A substantial increase in AUMs in comparison to Alternative 1 and continued growing season use in all pastures with ad hoc rest would not improve upland habitats and would continue to promote their degradation and transition to a stable state of decadent stands of big sagebrush with an undesirable understory of short-statured, shallow-rooted perennial and annual grasses. Because improvements in habitat conditions are not expected and a deterioration of wildlife habitats is likely in upland and riparian communities, significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would not occur under Alternative 2.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Effects to sage-grouse from livestock grazing under Alternative 2 are similar to those identified in Alternative 1 with the following differences. Effects would likely occur to a greater magnitude in comparison to Alternative 1 because a 21 percent increase in AUMs would be authorized, and growing and hot-season use would continue in upland and riparian areas. Negative effects of livestock grazing on sage-grouse would be more pronounced under Alternative 2 and would include and increased potential for trampling of eggs and subsequent nest desertion, degradation, loss, and avoidance of formerly suitable habitat caused by lack of adequate sagebrush and perennial herbaceous vegetation cover, and introduction of non-native weeds.

Under Alternative 2, BLM expects perennial herbaceous vegetation heights at the beginning and end of the nesting season in all pastures to be shorter than those expected under Alternative 1 (i.e., less than 5 inches at times). Average perennial herbaceous vegetation heights of less than 7 inches that could consistently result from grazing under Alternative 2 would not provide adequate nesting and brood-rearing cover in all grazed pastures most years. However, average perennial herbaceous vegetation heights could exceed 7 inches in pastures 1, 2, 3, and 5 during years that they were rested, which would provide better herbaceous cover periodically. In addition, the moderate utilization levels (i.e., up to 42 percent on average), frequent growing-season use, and lack of rest in pasture 4 that are likely to occur with implementation of Alternative 2 would not be adequate for the maintenance or improvement of vigorous and healthy perennial bunchgrass and rangeland vegetation which contribute to suitable sage-grouse habitat conditions.

Because implementation of Alternative 2 does not institute any practical measures for the conservation of special status species and would continue degradation of sage-grouse nesting habitat by reducing perennial herbaceous cover below suitable heights and allow frequent and prolonged grazing in PPH-sagebrush during the breeding season which could potentially result in trampling of eggs and nest failure, this alternative is not consistent with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular “to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA.”

<u>Pygmy Rabbit</u>
Stocking rates similar to those expected under Alternative 2 can increase livestock trampling effects such as reduced shrub cover and collapse of pygmy rabbit burrows (Siegel Thines, Shipley, & Sayler, 2004) (Hagar & Lienkaemper, 2007). The effects of grazing under Alternative 2 would continue habitat deterioration for many small to medium herbivores including pygmy rabbits.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Effects to birds from livestock grazing under Alternative 2 are similar to those identified in Alternative 1. However, effects would occur at a greater magnitude and affect additional species under Alternative 2 because many species dependent on herbaceous ground cover for nesting and/or foraging are negatively affected by moderate to heavy levels of livestock grazing (Bock, Saab, Rich, & Dobkin, 1993). Habitat for most bird species in the allotment would remain in a degraded condition. Effects of Alternative 2 include reduced cover from grasses and forbs, reduced nesting habitat, increased non-native grasses and forbs, reduced forage, simplified structural diversity, and disturbance to foraging activities.

The levels of livestock grazing that are expected on portions of the allotment under Alternative 2 have been shown to degrade sagebrush and shrub steppe habitat to the detriment of sagebrush-obligate species (Braun, Baker, Eng, Gashwiler, & Schroeder, 1976) (Paige & Ritter, 1999). Specifically, heavy grazing, which may occur in some locations in the allotment, reduces native perennial grass and forb cover, vegetative structure, suitable nest sites, and increases non-native grasses and promotes juniper expansion. Research on bird species in shrub steppe habitats found differing responses to moderate levels of grazing (Bock, Saab, Rich, & Dobkin, 1993). Based on the results of this study, special status and migratory bird species that would be negatively affected by Alternative 2 include Brewer's sparrow, grasshopper sparrow, Swainson's hawk, short-eared owl, and burrowing owl. Brewer's blackbird, black-throated sparrow, loggerhead shrike, and sage thrashers demonstrated mixed or no responses (Bock, Saab, Rich, & Dobkin, 1993). However, Bock and Webb (1984) found that some species that prefer open habitat responded positively to grazing. In the sagebrush steppe communities, several species are thought to respond positively to upland grazing at moderate levels including golden eagle and sage sparrow. These positive effects could occur in areas of moderate use; however, in areas of heavy use, effects could begin negatively affecting these species. Species that use riparian as well as other open habitat types such as Brewer's blackbird would probably benefit from moderate to heavy utilization. While these species are often found in riparian areas, they are not restricted to them and can be found in a wide variety of habitats.

Grazing effects to raptors under Alternative 2 would be similar to those identified in Alternative 1. Prey including small rodents, birds, and reptiles would decrease from loss of cover and forage under the moderate use levels expected under Alternative 2. These effects would be observed while grazing at the applicant's proposed use levels and would affect raptors that are within foraging range of the allotment. Ground nesting raptors including northern harriers and short-eared owls would experience reduced amounts of suitable nesting cover and potentially higher incidence of nest trampling on an annual basis from grazing.

Big Game and other Mammals (including Special Status Species)

Grazing effects to big game and other mammals under Alternative 2 would be similar to those identified in Alternative 1 with the following differences. The levels of utilization expected under Alternative 2 could have detrimental effects to big game species because intensive livestock grazing on browse species can reduce critical winter food supplies for deer and elk. Grazing use levels under Alternative 2 also would increase resource partitioning and probably result in spatial displacement of deer and elk from areas used by cattle (Stewart, Bowyer, Kie, Cimon, & Johnson, 2002).

3.5.5.1.3 Alternative 3 Effects

Under Alternative 3, substantial improvements to wildlife habitat in upland and riparian areas would be realized over the term of the permit. Implementation of Alternative 3 would include performance-based terms and conditions that were developed to protect and enhance native plant communities in the uplands and riparian areas, and breeding, brood-rearing, and foraging habitats for sage-grouse and other upland and riparian wildlife species (Table ALT-1). In addition to the terms and conditions discussed in Sections 3.5.1.2.3 and 3.5.4.3.3 (#13 and #14, respectively) which would benefit upland and riparian breeding, nesting, and foraging habitats for migratory birds, pygmy rabbits, and other wildlife species, the term and condition in Alternative 3 specific to sage-grouse breeding habitat (#15) includes a perennial herbaceous vegetation minimum height in PPH-sagebrush in all pastures. Compliance with the term and condition would provide suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season.

Under Alternative 3, upland wildlife habitat would improve in comparison to current conditions because compliance with the short-term indicator of limiting utilization of key forage species to levels less than or equal to 20 percent would allow for the recovery and maintenance of healthy, vigorous, and productive perennial bunchgrasses and native rangeland vegetation communities (Holechek, Gomez, Molinar, & Galt, 1999). Healthy vegetation communities provide the structure (e.g., physical patterns of life forms, individual physiognomy), function (e.g., energy flow, nutrient cycling), and composition (e.g., genetic, species, and ecosystem diversity) many wildlife species require to maintain robust and viable populations. Additionally, riparian wildlife habitat would improve for dependent species (e.g., migratory birds, wading birds) under Alternative 3 in comparison to current conditions because compliance with short-term indicators would maintain an herbaceous stubble height of at least 6 inches, a riparian shrub use level less than 30 percent, and limit bank and lentic edge alteration (less than 10 percent and less than 20 percent, respectively), thereby providing greater structural diversity and cover for wildlife species to nest, breed, forage, and conceal themselves. Recovery of wildlife habitat within the allotment could occur in the short term (3 to 5 years depending on the current degradation and ecological resiliency of the site) and would continue through the term of the permit; significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

Greater sage-grouse

Under Alternative 3, sage-grouse habitat in upland and riparian areas in all pastures would improve in comparison to current conditions, primarily due to an increase in perennial herbaceous cover (which provides greater concealment cover and protection from predators) and an overall improvement in vegetation community health and composition. Specifically, sage-grouse nesting habitat quality in upland areas would improve in comparison to Alternative 1 because average perennial herbaceous vegetation height would be required to exceed 7 inches thus ensuring a critical component of suitable nesting habitat throughout areas of PPH-sagebrush within the allotment. These improvements would be the direct result of compliance with the performance-based terms and conditions (#12 through 15). Improvements to sage-grouse brood-rearing habitat stability and forage availability and nesting cover would primarily result from compliance with performance-based terms and conditions #14 and #15 (average riparian herbaceous stubble height of at least 6 inches and average perennial herbaceous vegetation heights of at least 7 inches, respectively); whereas compliance with performance-based term and condition #13 (limit growing season utilization at less than or equal to 20 percent) would improve brood-rearing and summer habitats by allowing for healthy, vigorous, and diverse vegetation communities that could provide an abundance of prey (i.e., insects) and forage species. In addition, compliance with performance-based term and condition #13 potentially could increase concealment cover indirectly if utilization limits increase the quantity and vigor of desirable deep-rooted, tall-structured bunchgrasses which under typical growing conditions would likely result in average perennial herbaceous vegetation heights over 7 inches.

Grazing under Alternative 3 could occur during the critical growing season in pastures 1, 2, 3, and 4 every 2 out of 3 years. However, because utilization would not exceed 20 percent in these pastures due to compliance with term and condition #13, perennial bunchgrasses and upland vegetation communities would have the opportunity to recover from current conditions and increase in vigor over the term of the permit. On the other hand, because utilization could reach 50 percent in pastures 5 and 6 every year when grazed after the growing season, recovery of perennial bunchgrasses and upland vegetation communities would occur slowly but could occur over the term of the permit. Notwithstanding the potential for slower recovery in these pastures, perennial herbaceous residual vegetation heights would still need to average 4 inches at the beginning of the nesting season in pastures 5 and 6 to remain in compliance with term and condition #15.

Implementation of Alternative 3 with its performance-based terms and conditions specifically targeted at improving specials status species (i.e., migratory birds, sage-grouse, Brewer's sparrow, sage sparrow, loggerhead shrike, spotted bat, etc.) and their habitats in particular complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Pygmy rabbit

Under Alternative 3, habitat conditions for pygmy rabbits and other small to medium herbivores such as mice, voles, and jackrabbits would improve in comparison to Alternative 1. Compliance with terms and conditions #13 and #15 would result in improvements to perennial bunchgrasses and sagebrush communities and limits on live and residual herbaceous vegetation heights would enhance cover throughout the allotment for these species. There also would be more forage available from spring through late summer when pygmy rabbit herbivory of grasses and forbs occurs; reproduction and population recruitment would likely increase due to lower predation rates resulting from greater concealment cover and a greater abundance of forage species. Nevertheless, direct effects to pygmy rabbits potentially could include trampling of shrub cover, collapse of natal burrows and burrow complexes, and soil compaction during the breeding season.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Under Alternative 3 habitat for many bird species in the allotment, especially species associated with riparian areas, would experience improvements in comparison to current conditions. Compliance with terms and conditions #13-#15 would increase cover in upland and riparian areas overall and would provide improvements in nesting and foraging substrates and cover. Habitat structure and complexity from the current season of growth would be improved. An increase in herbaceous cover in riparian areas due to compliance with term and condition #14 would provide greater nesting and foraging opportunities because of an increase in cover and prey. Increases in herbaceous vegetation density are associated with increases in species richness and relative abundance, especially in Neotropical migrants (Dobkin, Rich, & Pyle, 1998). Forage would likely be more abundant and reproductive success probably would increase. Light utilization of herbaceous species in riparian areas that is expected with compliance with term and condition #14 would increase nest-screening cover.

However, potential effects to birds from early livestock use in upland habitats in pastures 1, 2, 3, and 4 (shrub steppe in particular) could include disturbance to nesting, and foraging activities, and trampling of nests at the onset and during the early breeding season. Compliance with terms and conditions #13 and #15 would result in improvements to perennial bunchgrasses and sagebrush communities and limits on live and residual herbaceous vegetation heights would enhance cover for most shrub steppe-obligate and -dependent species. Raptors could benefit from improved habitat conditions and increased levels of prey species due to increased protective cover, forage, and reproductive output. Effects to most raptors would be minimal, as the territories of most species extend beyond the allotment boundaries. Raptor reproduction probably would increase over time as conditions improved for prey species across the allotment. The early season of use in pastures 1, 2, 3, and 4 would expose ground-nesting raptors to a risk of trampling. However, on average, compliance with terms and conditions #13-#15 would result in increased nesting cover and improvements in vegetation communities overall.

Big Game and other Mammals (including Special Status Species)

Under Alternative 3, habitat for big game, particularly deer and elk, would improve in comparison to current conditions. Bighorn sheep habitat and effects to the species would be the same as those identified under Alternative 1. The amount of upland forage and cover would increase because of the utilization and stubble height limits stipulated in terms and conditions #13-#15. Herbivores would benefit from the increase in cover and forage throughout the allotment from leaving an adequate amount of the current year's growth.

3.5.5.1.4 Alternative 4 Effects

Under Alternative 4, wildlife habitat in upland and riparian areas would improve throughout the allotment compared to current conditions, due to a reduction in AUMs, an overall increase in acres/AUM, limits on growing season use, and frequent deferment. Utilization levels are expected to decrease and likely result in greater forage and cover for wildlife due to a reduction in AUMs which would result in an overall increase in acres/AUM. Limits on growing season use to once every 3 years in all pastures would result in fewer disturbances to breeding activities in uplands and riparian areas in comparison to Alternative 1. Periodic and frequent deferment in pastures 3, 4, 5, and 6 in conjunction with early spring use in pastures 1 and 2 would favor improvements in vegetation community composition, structure, and overall health. The subsequent increase in cover and forage for wildlife in upland and riparian areas (Section 3.5.1.2.4 and 3.5.4.3.4) are expected to occur over the short term (3 to 5 years) and the term of the permit. Habitats are expected to recover and improve and significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>

Under Alternative 4, sage-grouse habitat quality in upland and riparian areas in all pastures would improve in comparison to Alternative 1, primarily due to a reduction in AUMs, the early spring season of use, and periodic deferment. Grazing would not occur in pastures 3, 4, 5, and 6 during the lekking and nesting season which would eliminate potential direct effects of livestock to sage-grouse nests and eggs such as displacement from leks, trampling of eggs and nests, and subsequent nest desertion every 2 out of 3 years. In addition, in the absence of cattle grazing nesting and early brood-rearing cover would not be actively removed during the breeding season which would result in an increase in protective cover in comparison to Alternative 1. However, grazing would occur annually in pastures 1 and 2 during the early spring. Although grazing would occur during the lekking season and initiation of nesting efforts, it would occur before the active growing season and would allow substantial amounts of herbaceous regrowth to occur during the height of the nesting season which would provide suitable nest-screening cover and residual standing crop at the beginning of the following nesting season. Nevertheless, effects from livestock on sage-grouse during the early spring could potentially include displacement from leks, trampling of eggs, and subsequent nest abandonment.

Early spring use in pastures 1 and 2 and frequent deferment in pastures 3, 4, 5, and 6 would also result in improvements to perennial bunchgrasses and rangeland vegetation communities because livestock grazing would occur either before or after the growing season when most plant species are dormant and impacts have less effect on the health of the plants (Section 3.5.1.2.4). Over the term of the permit, vegetation community composition, structure, and health would improve overall in the absence of frequent growing season use resulting in an increase in abundance and vigor of perennial bunchgrass and therefore increased protective cover for nesting sage-grouse.

Because perennial herbaceous vegetation heights are expected to exceed 7 inches in pastures 1 and 2 at the beginning and end of the nesting season under current conditions, under the 71 percent reduction in AUMs in these pastures in comparison to Alternative 1, perennial herbaceous vegetation heights is expected to conform with recommended guidance (Connelly, Schroeder, Sands, & Braun, 2000) and greatly exceed 4 and 7 inches at the beginning and end of the nesting season, respectively. Based on historical utilization data for pastures 1 and 2 (approximately 31 percent or conservative use *sensu* (Holechek, Baker, Boren, & Galt, 2006)), continued conservative use or less would be expected with a 71 percent reduction in AUMs in comparison to Alternative 1; the resulting early spring light use would result in improved native perennial plant health and vigor and improvements in sage-grouse nesting and concealment cover in comparison to Alternative 1. Collectively, these changes could improve nesting success and juvenile survival and potentially lead to population increases.

Under Alternative 4, BLM would expect perennial herbaceous vegetation heights in pastures 3, 4, 5, and 6 to exceed 4 and 7 inches at the beginning and end of the nesting season, respectively, primarily due to the 45 percent reduction in AUMs across the allotment overall. Although pastures 3, 4, 5, and 6 are not expected to exceed 7 inches at the end of the nesting season regularly under Alternative 1, the frequent deferment and 45 percent reduction in AUMs overall with implementation of Alternative 4 would allow perennial herbaceous vegetation heights in these pastures to meet recommended guidelines (Connelly, Schroeder, Sands, & Braun, 2000). Deferment would lead to improvements to perennial bunchgrasses and rangeland vegetation communities because livestock grazing would occur after the growing season when most plant species are dormant and impacts have less effect on the health of the plants, and the substantial reduction in AUMs would result in even lighter use in pasture 3, 4, and 6 (less than 20 percent utilization), and conservative use in pasture 5 (30 percent utilization). In conjunction, these factors would result in perennial herbaceous vegetation heights in all pastures exceeding 4 and 7 inches at the beginning and end of the nesting season, respectively.

Light to conservative use is consistent with improving native perennial plant health and vigor (Holechek, Gomez, Molinar, & Galt, 1999) which would correspond with improvements in sage-grouse nesting and concealment cover in comparison to Alternative 1. These changes could improve nesting success and juvenile survival and potentially lead to population increases.

Implementation of Alternative 4, with its attendant reduction of AUMs and change in season of use specifically targeted at improving upland habitats for special status species, shrub steppe associated wildlife, and sage-grouse nesting habitat, complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Pygmy rabbit

Because shrub steppe habitat in all pastures is expected to improve under Alternative 4, as discussed in the sage-grouse section above, cover and spring forage for pygmy rabbits would also improve in comparison to current conditions.

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Compared to Alternative 1, habitat for many bird species in the allotment would experience substantial improvements under Alternative 4. Obligate and dependent species including migratory birds and special status species using the shrub steppe and grassland habitats across the allotment would be benefitted by eliminating disturbance due to livestock grazing during the breeding season in years of deferment. However, potential effects to birds in pastures 3, 4, 5, and 6 during years with spring livestock use include reduced cover of grasses and forbs, disturbance to breeding, nesting, and foraging activities, and trampling of nests. Effects to most raptors would be minimal as the territories of most species extend beyond the allotment boundaries. Under Alternative 4, habitat improvement for raptor prey species and consequently raptors would be similar to those discussed previously for Alternative 3.

Big Game and other Mammals (including Special Status Species)

Under Alternative 4, habitat for big game would improve over current conditions and would be similar to those discussed previously for Alternative 3. The amount of upland forage and cover most likely would be similar to Alternative 3 in all pastures in years that they are grazed during the growing season. Bighorn sheep habitat and effects to the species would be the same as those identified under Alternative 1.

3.5.5.1.5 Alternative 5 Effects

Extended rest would dramatically improve conditions for all species of wildlife throughout the Garat allotment. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. In general, all of the negative effects associated with grazing identified in this EA would cease across the allotment. Overall, the allotment would become much more diverse and productive as wildlife habitats improved and population numbers for most species increased. Wildlife objectives would be met and there would be substantial progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals).

Focal Special Status Animal Species

Greater sage-grouse

Under Alternative 5, sage-grouse would benefit from the removal of livestock from the allotment because the negative effects of livestock grazing would no longer occur to the species or their habitat. Potential negative effects of livestock grazing on sage-grouse include trampling of eggs and subsequent nest desertion, and degradation, loss, and avoidance of formerly suitable habitat (Beck & Mitchell, 2000). With the removal of livestock, nesting structure and cover are expected to increase in uplands, along with a similar increase and improvement of late brood-rearing habitat in meadows and riparian areas. Sage-grouse have been shown to select brood-rearing habitat with taller grasses and increased herbaceous cover; increased herbaceous biomass is correlated with invertebrate prey abundance and the increased vertical and horizontal cover it affords most likely imbues greater protection from predators, both of which could increase juvenile survival (Kaczor, et al., 2011). Under Alternative 5, improved habitat conditions could result in higher nesting success, juvenile survival, and productivity which could increase local population numbers.

Because implementation of Alternative 5 would exclude livestock disturbance and all associated impacts from more than 200,000acres within the allotment (including 150,000 acres of PPH-sagebrush) and establish a landscape-sized refuge for migratory birds, a multitude of special status species, and an identified sage-grouse subpopulation stronghold in an otherwise increasingly inhospitable matrix of degraded habitat, the alternative complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Pygmy rabbit

Removal of livestock grazing would improve habitat conditions for pygmy rabbits in a variety of ways under Alternative 5. An increase in quantity and improvement of species composition of grasses (particularly native perennial bunchgrasses) and forbs would provide more and higher-quality spring and summer forage (Siegel Thines, Shipley, & Sayler, 2004). In addition, a reduction of soil compaction and burrow collapse and an increase in use (as determined by burrows per unit area) would be expected with removal of livestock (Siegel Thines, Shipley, & Sayler, 2004).

Migratory Birds, Raptors, and other Birds (including Special Status Species)

Under Alternative 5, birds would benefit because of the increased productivity of all habitat types they utilize. Springs would improve and expand and streams would eventually experience widening riparian areas, resulting in increased levels of riparian habitat for obligate and dependent species across the allotment. Bird diversity and numbers increase when livestock are removed from an area (Taylor & Littlefield, 1986) (Bock, Saab, Rich, & Dobkin, 1993) (Dobkin, 1998) (Krueper, Bart, & Rich, 2003) (Earnst, Ballard, & Dobkin, Riparian songbird abundance a decade after cattle removal on Hart Mountain and Sheldon National Wildlife Refuges, 2005) (Earnst, Dobkin, & Ballard, 2012). Nesting structure and cover would increase and lead to greater reproductive success and improved population numbers. Improved habitat conditions under Alternative 5 also would benefit all raptor species; nesting conditions would improve and prey numbers would increase, leading to greater levels of successful reproduction and survival of offspring.

Big Game and other Mammals (including Special Status Species)

All mammals and big game species would benefit from removal of livestock from the allotment under Alternative 5. There would be more available forage for all herbivorous species and increased levels of protective cover. Desirable perennial bunchgrass and forb species would increase over time and competition between cattle and other herbivores would not occur. Population numbers of big game and other herbivores would be expected to increase. Livestock trampling of cover and collapse of burrows would not occur. Willow would be expected to increase across the allotment at suitable sites.

3.5.5.2 Cumulative Effects

Although the scope, past, present, and foreseeable future actions, and current conditions of the cumulative effects analysis area for the Garat allotment are the same as those described in Section 3.4.5.3, they are summarized briefly below for immediate reference.

Scope

The cumulative effects analysis area for fish and wildlife resources is delineated by the approximately 5.7 million-acre Owyhee sage-grouse subpopulation (Map CMLV-3) (Connelly, Knick, Schroeder, & Stiver, 2004). Given the current conservation importance of greater sage-grouse, it is logical, if not imperative, to choose an analysis area that is biologically relevant to the species. The Owyhee subpopulation area also provides meaningful context and relevance for large and/or highly mobile species (e.g., big game, raptors, and migratory birds) while greatly exceeding the range of many resident fish and wildlife species. Analysis timeframes include past activities that have created the present conditions, and future activities planned within the next three years, including the expected duration of effects from current and future activities (generally 10 to 20 years).

Current Conditions

The past, present, and reasonably foreseeable future actions within the cumulative effects analysis area relevant to fish and wildlife resources have been previously presented in Table WDLF-4. In much of the analysis area, upland, riparian, and stream habitats have been adversely affected by grazing practices and rangeland management infrastructure, wildfire, vegetation treatments, and habitat fragmentation due to buildings, roads, and transmission line. As a result, wildlife habitat and populations in the analysis area have been altered from the conditions before Euroamerican colonization of North America and what would be expected under a natural disturbance regime. The current conditions of the past, present, and reasonably foreseeable future actions have been described previously in Section 3.4.5.3.

Deer, elk, pronghorn, and bighorn sheep are common in the analysis area and long-distance, interstate movements to seasonal ranges have been documented. The surrounding deep canyons of the Owyhee River system provide relatively undisturbed cliff nesting habitat for a variety of wide-ranging raptors and bird species. The shrub steppe ecosystem is well represented within the cumulative effects analysis area and provides vital habitat for many shrub-dependent species such as sage-grouse, Brewer's and sage sparrows, loggerhead shrike, and pygmy rabbits. Although populations of some notable species (e.g., sage-grouse) have declined rangewide, population trends in the analysis area for most fish, wildlife, and special status species are unknown because long-term monitoring data are lacking. Across their distribution, sage-grouse and bighorn sheep have been impacted by disease (i.e., WNV and pneumonia, respectively). Although these diseases currently do not appear to be an issue with local sage-grouse and bighorn sheep, WNV has been documented in sage-grouse in Idaho. There appears to be a relatively low risk of contraction of pneumonia by Owyhee River PMU bighorn sheep because the primary vectors of transmission, domestic sheep, do not overlap with the local population (i.e., Owyhee River PMU in Idaho and the Upper Owyhee River Herd in Oregon collectively).

3.5.5.2.1 Alternatives 1 and 2 Effects

Under Alternatives 1 and 2, grazing management has been shown to reduce cover and forage for wildlife in uplands. In addition, frequent grazing during the active growing season in the uplands has led to static or would lead to deteriorating habitat conditions that have not allowed or would not allow improvements to perennial bunchgrass vigor and health nor progress toward a full complement of native perennial species consistent with ecological site potential. Continuation of grazing management under these alternatives would decrease upland vegetation that wildlife use for nesting substrate, cover, and foraging habitat. These effects would negligibly contribute to an overall decrease in the quality of wildlife habitat throughout the cumulative effects area. In addition, the number of individuals necessary to support neighboring wildlife populations and maintain the genetic diversity of existing populations across the landscape could decrease. The continued degradation of upland habitats would negatively affect habitat for many species of migratory birds and sage-grouse.

When these factors are combined with the past, present, and reasonably foreseeable future actions that have impacted wildlife habitats within the cumulative effects area, the static to downward trend in habitat conditions within the Garat allotment would not meet ORMP wildlife and special status species management objectives. Conditions are not expected to improve in upland habitats for sage-grouse, and significant progress toward meeting the Idaho rangeland health standard for special status animals would not occur due to the continuation of growing season use in 2 out of every 3 years, which degrades rangeland vegetation communities. Although the amount of PPH-sagebrush within the allotment by itself is substantial (approximately 150,000 acres) it makes up a relatively small percentage (less than 2 percent) of the cumulative effects area, and the threshold for unacceptable change in the majority of wildlife population including the Owyhee sage-grouse subpopulation most likely would not be exceeded.

3.5.5.2.2 Alternatives 3 and 4 Effects

Under Alternatives 3 and 4, substantial improvements to wildlife habitat in upland and riparian areas would be realized over the term of the permit. Implementation of Alternatives 3 and 4 would include performance-based terms and conditions and seasoned-based conservation measures, respectively, that were developed to protect and enhance native plant communities in the uplands and riparian areas, and breeding, brood-rearing, and foraging habitats for sage-grouse and other upland and riparian wildlife species. The performance-based and season-based approaches would implement grazing practices that would provide suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season throughout PPH-sagebrush within the allotment. The expected improvements from proposed grazing management, considered cumulatively with other activities, should benefit wildlife habitat and populations overall. However, improving wildlife populations within the allotment would negligibly contribute to more robust regional fish and wildlife populations.

Sage-grouse PPH-sagebrush within the allotment is extensive and connected to large areas of sagebrush habitat to the south and east. Adjacent shrublands are comprised of large areas of contiguous, intact sagebrush habitats in Idaho and Nevada. Trend information for the Owyhee subpopulation is limited, as leks are surveyed infrequently primarily due to inaccessibility. However, sage-grouse habitat within the allotment most likely represents the periphery of the range of the local population (i.e., deme). Any adverse effects occurring in the allotment would probably have minimal consequences to the local Owyhee subpopulation. Trends in sage-grouse populations at the broadest scale in this analysis (i.e., population level) are more readily available. A recent analysis shows that the proportion of active leks and the average number of males per active lek has decreased over the last 40 years within the Northern Great Basin population (Garton, et al., 2011). The minimal effects to the local sage-grouse deme from grazing management actions occurring in the Garat allotment would have a negligible effect on the viability of the regional Northern Great Basin population or the species range-wide.

Although improvement to wildlife and sage-grouse habitats at the allotment level are expected under Alternatives 3 and 4, and direct and indirect effects from grazing management of this project are expected to be relatively localized, cumulative effects from this project, along with other past and ongoing activities within the cumulative effects area, are not likely to negatively affect any special status species' viability in a substantial way, nor lead to the need for any listing under the ESA. Recovery of wildlife habitat within the allotment could occur in the short term under these alternatives and would continue through the term of the permit. Significant progress toward meeting the Idaho rangeland health standard for special status animals would occur. The threshold for unacceptable change in the majority of wildlife populations including the Owyhee sage-grouse subpopulation most likely would not be exceeded due to the small size of the allotment in relation to the cumulative effects area.

3.5.5.2.3 Alternative 5 Effects

The extended rest under Alternative 5 would depart markedly from the predominant grazing systems in the analysis area, creating a unique, large area undisturbed by livestock grazing, which would provide an enormous refuge for wildlife within the allotment and surrounding areas. Extended rest would dramatically improve conditions for all species of wildlife throughout the Garat allotment. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. The undisturbed mosaic of habitats could augment wildlife populations in the allotment, and could provide a productive source area for surrounding allotments.

Cumulative effects to sage-grouse and their habitats within the cumulative effects area would be the same as those described above for Alternatives 3 and 4. Wildlife objectives would be met and there would be substantial progress toward meeting Idaho rangeland health standard for special status animals. Progress would be realized toward improving wildlife habitat conditions below the threshold of unacceptable change. The expected improvements considered cumulatively with other activities should benefit wildlife habitat and populations overall. However, improving wildlife populations within the allotment would negligibly contribute to more robust regional wildlife populations.

3.5.6 Recreation

3.5.6.1 Affected Environment

The majority of the Garat allotment is located within the Owyhee Extensive Recreation Management Area. Portions of the allotment along the northern, western, and eastern boundaries, which are adjacent to the East Fork Owyhee River and South Fork Owyhee River corridors, are within the Owyhee River

SRMA. The main recreational activities within the allotment are hunting, trapping, camping, fishing, sight-seeing, backpacking, horseback riding, and nature study.

The East Fork of the Owyhee River lies adjacent to the northern and eastern boundaries of the allotment. Additionally, a 31.4-mile stretch of the South Fork Owyhee River borders the western boundary of the allotment. These two river systems are within the Owyhee River Wilderness and have been designated as wild rivers in the Omnibus Public Lands Management Act. The 1.2-mile section of the South Fork Owyhee River surrounding the Forty-Five ranch has been designated as a recreational river. These river systems offer a variety of recreational opportunities including: whitewater rafting in the early spring/summer months, fishing, backpacking, and hunting and trapping in the fall. Boaters as well as other recreationists frequent a number of the access points along the East Fork and South Fork Owyhee Rivers such as the Garat, South Fork Pipeline, and Forty-Five Ranch launch sites; these sites are all accessed through the Garat allotment.

The OHV designations for the allotment are limited to Existing and Closed. The areas identified as closed to motorized vehicles are within the Owyhee River Wilderness. The remainder of the area would be categorized as limited to Existing roads and trails. The ORMP does identify areas within the allotment as limited to Designated; however, until the area undergoes a travel planning and route designation process, the area would remain as limited to Existing.

The ROS classification is used to characterize the type of recreational opportunity settings, activities, and experience opportunities that can be expected in different areas of public land. The Garat allotment contains multiple settings for recreationists such as Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, and Roaded Natural.

The Primitive, Semi-primitive Non-motorized and Semi-primitive Motorized classifications were described earlier in this document (Sec. 3.5.6.1). The Roaded Natural classification is an area that is characterized by a generally natural environment with only moderate evidence of the sights and sounds of humans. Resource modifications and utilization practices are evident but harmonize with the natural environment (USDI BLM, 1999a).

3.5.6.2 Direct and Indirect Effects

3.5.6.2.1 Alternative 1 Effects

Effects to recreation would be the interaction with livestock during periods of livestock use. During periods of non-livestock use, no impacts would be expected. Areas that were improving under the current grazing system would likely continue to improve and provide enhanced opportunities for recreation. Hunting is the most likely recreation opportunity to be impacted as grazing within pastures 5 and 6 would slightly overlap with some big-game seasons. These impacts are considered to be negligible.

3.5.6.2.2 Alternative 2 Effects

Effects to recreationists would be greater under this alternative as opposed to Alternative 1, due to the increase in the number of livestock and AUMs. The proposed increase in numbers may result in more frequent human/livestock interactions. Similar to Alternative 1, hunting is the most likely recreational activity to be impacted as proposed grazing schedules could slightly overlap with some big game hunting seasons within pastures 4 and 6. These impacts are considered minimal; however, no enhanced opportunities for recreation would occur under this alternative due to the increase in livestock numbers.

3.5.6.2.3 Alternative 3 Effects

The proposed performance-based terms and conditions that are associated with this alternative would make it more beneficial to recreationists than Alternative 1. As conditions of the area improve, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area. Human/livestock interactions would still occur under this alternative as grazing schedules overlap with big game hunting seasons, however, these impacts are considered negligible.

3.5.6.2.4 Alternative 4 Effects

The proposed season-based alternative, in combination with fewer AUMs and reduced livestock numbers, would reduce interactions between livestock and recreationists overall. However, this alternative's season of use within most pastures runs through 10/15, thus overlapping even more so than other alternatives with not only big-game hunting seasons but upland game bird hunting seasons as well. These impacts, however, are negligible.

As conditions of the area improve due to the season-based use and fewer AUMs and livestock numbers, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area.

3.5.6.2.5 Alternative 5 Effects

This alternative would provide the greatest benefit to recreationists within the allotments. There would be no interaction between livestock and recreationists, and as the overall conditions of the area improved so would visual quality, thus creating a more enjoyable recreation experience. Improved wildlife habitat conditions would increase wildlife viewing opportunities and potentially result in increased hunting success.

3.5.6.3 Cumulative Effects

Cumulative effects to recreation within the Garat allotment would primarily be the result of grazing, and current and future actions that stem from the OPLMA. The area of analysis for cumulative effects is the area south of the Owyhee River system (delineated roughly by the Owyhee River on the north, Deep Creek and the Owyhee River on the east, the Nevada border on the south, and the Oregon border on the west). This area is a good representation of the summer/fall recreation activities that occur within the area. The Owyhee River system serves as a natural boundary on the north; there are a couple of crossings along the river system, but most recreational activity accessed from via Highway 51 in Nevada stays south of the river system. The timeframe for current conditions includes activities that have occurred since the passing of the OPLMA, and reasonably foreseeable future activities include those planned within the next 3 years, as well as the expected duration of effects from those activities (generally 10 to 20 years).

3.5.6.3.1 Alternatives 1- 5 Effects

Cumulative analysis of the alternatives listed above, when added to past, present, and future actions, within the cumulative analysis area, would have minimal effects to recreation overall. Because there are very few effects are expected from any of the alternatives listed above, positive or negative, cumulative effects would be minimal for recreation. Opportunities for recreational activities in the cumulative analysis area are abundant and would endure minimal impact from any of the alternatives.

Impacts associated with past, present, and future activities would consist of range improvements, such as fences, identified throughout the analysis area that would reduce some opportunities for non-motorized cross country travel. Accessibility in the area for hunters and other recreationists who rely heavily on roads and trails for motorized access would be reduced as a result of recent wilderness designations. During periods of livestock use, there would be an increase in potential human/livestock interactions.

In the long term, the combined effects of suitable grazing management, designation of wilderness areas, wild and scenic rivers, and travel management planning within the cumulative analysis area would be beneficial to the overall health and scenic quality of the area, which in turn would result in an improved recreation experience.

3.5.7 Visual Resources

3.5.7.1 Affected Environment

The majority of this allotment is categorized as Class IV, with the western, northern, and eastern edges of the allotment that lie within the Owyhee River Wilderness categorized as Class I. There are also approximately 9,000 acres of Class II along portions of the wilderness boundary throughout the allotment. There had previously been some Class II IMP designations within the wilderness study areas, but those areas were released from wilderness study through the passage of the OPLMA and are now categorized as Class IV as directed by the ORMP.

3.5.7.2 Direct and Indirect Effects

3.5.7.2.1 Alternative 1 Effects

The grazing schedule under Alternative 1 would maintain existing visual conditions of the area. There are certain areas throughout the allotment which are not meeting the rangeland health standard for native plant communities (pasture 4) or ORMP vegetation management objectives and would conceivably continue to not meet these standards and objectives under the proposed grazing schedule. These impacts are considered acceptable throughout much of the allotment. However, in those areas categorized as VRM Class I and II, such as in pasture 4, if the area were to be further impacted, those impacts would not be considered acceptable, as the goal is to retain or preserve the existing character of the landscape.

Additionally, there are no riparian areas/stream segments identified within Class I VRM as non-functioning due to grazing where the level of change to the characteristic of the landscape should be very low. Segments classified as non-functioning are located within Class IV VRM. Overall, any impacts to visual resources associated with the proposed grazing system would be negligible and are considered acceptable with the VRM objectives for the area.

3.5.7.2.2 Alternative 2 Effects

With the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment. Areas have been identified under current management (pasture 4) as not meeting the rangeland health standard for native plant communities; other areas have also been documented as not meeting ORMP vegetation management objectives. Additionally, in stream segments throughout the allotment that are identified as non-functioning or functioning-at-risk, an increase in livestock and AUMs within these areas would only exacerbate those impacts. Because much of the allotment is categorized as Class IV VRM, these impacts would be considered acceptable. However, in the areas (periphery of pastures 1, 2, 3, 4, and 5) where VRM classifications are categorized Class I and II, these impacts would not be considered acceptable, as the goals of these areas are to retain or preserve the existing character of the landscape, and the levels of change to the characteristic of the landscape should be low.

3.5.7.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial to visual resources throughout the area than Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are being met and conditions of the area are improving, which would be beneficial to visual resources throughout the allotment

3.5.7.2.4 Alternative 4 Effects

The effects associated with the proposed grazing schedule under this alternative would be beneficial to visual resources throughout the area. The proposed season-based alternative in combination with fewer AUMs and reduced livestock numbers would improve the overall health and visual quality of the allotment. Areas that are currently improving would continue to do so, and areas that have been affected by heavy livestock use would also begin to show improvement.

3.5.7.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest amount of benefits to visual resources across the board. There would be no effects to upland vegetation and riparian areas due to livestock grazing, thus improving the overall health and visual quality throughout the allotment.

3.5.7.3 Cumulative Effects

Cumulative effects area would be the same as that described in Section 3.5.6.3.

3.5.7.3.1 Alternatives 1, 3, 4, 5 Effects

Because few effects are expected from these alternatives, cumulative effects would be minimal for visual resources within the cumulative analysis area. Grazing activities throughout the analysis area would contribute in varying magnitudes toward cumulative effects by influencing plant species composition within the uplands as well as riparian areas. While these impacts may be greater or lesser within differing allotments, overall these impacts would be considered minimal throughout the cumulative analysis area as a whole.

Overall, the combined effects of suitable grazing management, designation of wilderness areas, wild and scenic rivers, and travel management planning within the cumulative analysis area would be beneficial to the overall health and scenic quality of the area.

3.5.7.3.2 Alternative 2 Effects

The impacts associated with this alternative in combination with past, present, and fute actions would be strictly related to those areas of Class I and Class II VRM classifications, which are essentially those pieces within or immediately adjacent to wilderness. The remainder, and majority of the cumulative analysis area, is categorized as Class IV and the impacts associated with grazing and other past, present, and future actions are acceptable.

In areas where VRM classifications are categorized Class I and II, impacts associated with grazing under this alternative would not be considered acceptable. As discussed above, areas have been identified as not meeting Standards and ORMP objectives under current grazing management. Under this alternative, with the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment. This is acceptable throughout the majority of the allotment (Class IV), however within Class I and II VRM, the goals of these areas are to retain or preserve the existing character of the landscape, and the levels of change to the characteristic of the landscape should be low.

The combined effects of past and future actions such as the wilderness designation and travel management planning throughout the cumulative analysis area would be beneficial to the overall health and scenic quality as resources are further protected. These benefits could be contradicted, however, in areas of Class I and II VRM under this alternatives grazing schedule.

3.5.8 Areas of Critical Environmental Concern and Research Natural Areas

3.5.8.1 Affected Environment

The applicable ORMP objective for management within Areas of Critical Environmental Concern identifies that BLM will “Retain existing and designate new areas of critical environmental concern (ACECs) where relevance and importance criteria are met and where special management is needed to protect the values identified.” The Garat allotment includes portion of the Owyhee River Bighorn Sheep Habitat Area.

Owyhee River Bighorn Sheep Habitat Area (141,796 acres; Bighorn sheep)

Designation of the ACEC was intended to enhance habitat for bighorn sheep, to maintain or improve the habitat to at least a good range condition class, and to protect and maintain the scenic and natural values present in the area. Much of this ACEC is located within the recently designated Owyhee River Wilderness Area. At the time of writing the 1999 ORMP, it was estimated that between 500 and 700 bighorn sheep occupied the areas within the ACEC and it was anticipated that the populations would expand into adjacent habitats in Nevada. Bighorn sheep already exist in adjacent habitats in Oregon. In addition to bighorn sheep, this ACEC is contains a diversity of other wildlife including various raptors, sage grouse, migratory birds, predators, and big game.

In accordance with the 1999 ORMP (USDI BLM, 1999a), the Owyhee River Bighorn Sheep Habitat Area ACEC is designated as being:

- Excluded from Rights-of-Way actions for surface and subsurface development;
- Prohibited to developing springs and pipelines, wildlife water sources and reservoirs (on 29,520 acres in the ACEC), pasture and exclosure fencing (on 29,520 acres in the ACEC), and juniper/vegetation treatment projects; and,
- Other multiple use activities including restrictions associated with developing wildlife water sources and reservoirs (on 112,276 acres in the ACEC), livestock salting and grazing, pasture and exclosure fencing (on 112,276 acres in the ACEC), and fire suppression and rehabilitation actions (USDI BLM, 1999a).

3.5.8.2 Direct and Indirect Effects

3.5.8.2.1 Alternatives 1-4 Effects

The applicants’ proposed actions, as limited in this EA to no project construction, and the current situation, performance-based, and season-based alternatives, do not include proposals to construct projects or engage in surface disturbing activities. As a result, none of the activities excluded or prohibited within the Owyhee River Bighorn Sheep Habitat Area ACECs would be affected. Activities restricted within the ACEC, including livestock grazing and salting, would continue to be restricted equally under each of the four alternatives, as directed by the ORMP guidance. Relevant and important values for which the ACEC was designated would continue to be protected.

3.5.8.2.2 Alternative 5 Effects

The no-grazing alternative would not include activities excluded or prohibited within Owyhee River Bighorn Sheep Habitat Area ACECs. Similarly, the alternative would eliminate the need for compliance inspections related to restrictions to livestock grazing and salting within the portions Owyhee River Bighorn Sheep Habitat Area ACEC that occur in the Garat allotment. Elimination of the need for compliance inspections related to restrictions to livestock grazing and salting would extend through the ten-year term of livestock exclusion from the Garat allotment. Relevant and important values for which the ACEC was designated would continue to be protected.

3.5.8.3 Cumulative Effects

The cumulative effects analysis area for ACECs is defined by the bounds of the Bureau of Land Management Owyhee Field Office. The land use plan for the Owyhee Field Office, the ORMP, designated 12 ACECs totaling 167,372 acres. Restrictions to activities authorized were included in the management direction provided by the plan.

3.5.8.3.1 Alternative 1-5 Effects

Activities excluded, prohibited, or restricted in the 12 ACECs, as identified in the ORMP, would retain relevant and important values unchanged and protected in the cumulative effects analysis area.

3.5.9 Wilderness and Wild and Scenic Rivers

3.5.9.1 Affected Environment

A portion of the Owyhee River Wilderness is included within the boundaries of the Garat allotment. In 2009, this area was designated as wilderness through OPLMA. The Owyhee River Wilderness is 267,328 acres in size, and roughly 49,653 acres lie within the allotment.

The East Fork and South Fork Owyhee Rivers make up the northern and western borders of the allotment. These rivers were designated as wild rivers in the OPLMA. A 1.2-mile section of river on the South Fork Owyhee River surrounding the Forty-Five Ranch was designated as recreational.

Both wild river segments are outside of the allotment adjacent to the southern and southwestern boundaries. Livestock access to the wild river corridors are restricted by natural barriers and fencing. Both wild rivers contain a multitude of ORVs, including scenic, recreational, geologic, and wildlife values (USDI BLM, 1999a). ORVs are defined as those characteristics that make the river worthy of special protection.

3.5.9.2 Direct and Indirect Effects

3.5.9.2.1 Alternative 1 Effects

Overall, the impacts to wilderness under the proposed alternative are expected to be minimal, as only a portion (49,653 acres) of the roughly 267,000-acre Owyhee River Wilderness lies within the allotment. Continuation of the current grazing schedule would maintain existing conditions in the uplands and riparian areas. There are, however, certain areas throughout the allotment which are not meeting the rangeland health standard for native plant communities (pasture 4) or ORMP vegetation management objectives, and would conceivably continue to not meet these standards and objectives under the proposed grazing schedule. Understanding that grazing is an allowable grandfathered use within the Owyhee River Wilderness, BLM must manage public lands to meet standards as well as to protect and enhance wilderness characteristics. If upland and riparian vegetation conditions are not maintained or improved within wilderness from the time of designation (2009), the area’s naturalness and visual qualities would be impacted. These impacts may only affect a small portion of the wilderness, as only roughly 9,000 acres lie within pasture 4 and thus would not impair wilderness character as a whole. However, these impacts, if they do occur, would not be in conformance with the Wilderness Act, which states to preserve and protect these features within wilderness.

There are no riparian areas/stream segments identified within wilderness as non-functioning due to grazing. Therefore, the area's naturalness, wilderness character, and values would be preserved under this alternative, which would be in conformance with the Wilderness Act.

There would be no impacts to solitude or primitive and unconfined recreation in this alternative.

Additionally, the wild river segments would remain in conformance with the Wild and Scenic River Act. Livestock are unable to access these river segments due to topography, so there would be no impacts from grazing to the outstanding remarkable values associated with the wild river corridors.

3.5.9.2.2 Alternative 2 Effects

With the combination of increased AUMs and livestock numbers, upland vegetation communities and riparian areas would not be expected to improve throughout the allotment under this alternative. There are currently areas that have been identified as not meeting the rangeland health standard for native plant communities; other areas have also been documented as not meeting ORMP vegetation management objectives. The proposed grazing schedule would exacerbate these effects, and the area's naturalness in uplands and riparian areas throughout the allotment would be negatively affected, thus impacting wilderness characteristics and values. Recognizing these criteria and understanding that grazing is an allowable grandfathered use within the wilderness areas, BLM must manage public lands to meet standards as well as to protect and enhance wilderness characteristics. This would not be in conformance with the Wilderness Act, which states to preserve and protect these features within wilderness.

There would be no impacts to solitude or primitive and unconfined recreation in this alternative.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.5.9.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial than those identified in Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are being met and conditions are improving throughout the allotment, which in turn would be beneficial to the area's naturalness, thus enhancing wilderness characteristics and values.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.5.9.2.4 Alternative 4 Effects

Implementation of the proposed grazing system would conform to the Wilderness Act. Overall the conditions of the area would improve due to the combination of a season-based alternative, fewer AUMs and reduced livestock numbers. This would improve ecological health, naturalness, and visual quality throughout the allotment, thus enhancing wilderness characteristics and values.

The impacts to wild and scenic rivers would be the same as those described in Alternative 1, as livestock are unable to access the wild river corridors.

3.5.9.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest benefit to wilderness characteristics. There would be no effects to upland vegetation and riparian areas due to livestock grazing. The overall health, naturalness, and visual quality throughout the entire allotment would improve, thus enhance wilderness characteristics and values.

3.5.9.3 Cumulative Effects

The cumulative effects area would be the same as that identified in Section 3.5.6.3.

3.5.9.3.1 Alternatives 1, 3, 4, 5 Effects

Cumulative effects to these alternatives would be the same as those discussed in Section 3.5.6.3.1.

3.5.9.3.2 Alternative 2 Effects

Much like the Alternatives 1, 3, 4, and 5, the effects from past actions such as the recent designation of the wilderness, and future actions such as travel management planning, which will occur outside the wilderness boundaries, would be beneficial to wilderness areas and wild and scenic rivers, as the lands within and surrounding the cumulative analysis area improve overall as resources are further protected.

Cumulatively however, these benefits, when combined with the Alternative 2 grazing schedule, could conceivably be contradicted. Under the Alternative 2 grazing schedule, upland vegetation communities and riparian areas would not be expected to improve. As discussed above, there are currently areas that have been identified as not meeting standards and ORMP management objectives within the cumulative analysis area. The grazing schedule under this alternative would exacerbate these effects, and the area's naturalness in uplands and riparian areas would be negatively affected, thus impacting wilderness characteristics and values.

These impacts to the cumulative analysis area may only affect a small portion of the wilderness, and may not impair the wilderness designation as a whole, however, the impacts would not be in conformance with the Wilderness Act, which states to protect or enhance wilderness character throughout the entire wilderness.

3.5.10 Lands with Wilderness Characteristics (Outside of Designated Wilderness)

3.5.10.1 Affected Environment

There were no units outside of designated wilderness within the Garat allotment found to contain LWCs.

3.5.11 Economic and Social Values

3.5.11.1 Affected Environment

The Garat allotment is located in Owyhee County, Idaho, approximately 75 miles south of Murphy, Idaho and 15 miles northwest of Owyhee, Nevada. The allotment is bordered by the East Fork Owyhee River on the north, South Fork Owyhee River on the west, the Nevada state line on the south and the Duck Valley Indian Reservation on the east (Maps RNGE-2 through 6)). The Garat allotment includes 202,618 acres of public land, 8,836 acres of state land, and 207 acres of private land in six pastures (Table ALLOT-4, Map RNGE-2-6).

Table ALLOT-4: Total acres by pasture and ownership within the Garat allotment in 2011

Allotment	Pasture	Pasture Name	Public	State	Private	Total
Garat	1	Dry Lake	14,551	636	0	15,187
	2	Piute Creek	19,765	635	0	20,400
	3	Forty-Five	42,932	1,644	0	44,576
	4	Kimball	38,492	2,519	45	41,056
	5	Big Horse	38,027	922	78	39,023
	6	Juniper Basin	48,854	2,481	85	51,412
Total			202,618	8,836	207	211,654

The ORMP, the land use plan for Owyhee Field Office, categorized Garat allotment as an improved (I) category allotment with a low priority for management. Categorization of allotments in that land use plan prioritized development and implementation of grazing systems to meet multiple use resource objectives and rangeland health standards based on resource conditions, potentials, and concerns, as well as economics, present management, and other criteria.

In addition to allocating livestock grazing within the Garat allotment, the ORMP identified issues associated with livestock grazing with a listing of resource concerns and applicable ORMP resource objectives. Resource concerns identified included the high erosion potential on greater than 30 percent of the public land within the allotment, ecological condition of vegetation communities, noxious weeds, perennial surface water, riparian-wetland ecosystems, crucial big game winter habitat (mule deer), and special status species (bighorn sheep, burrowing owl, plant, redband trout, and sage-grouse. Applicable ORMP management objectives identified included SOIL-1, VEGE-1, WATR-1, RIPN-1, WDLF-1, and SPSS-1[67].

One grazing permit authorizes livestock grazing use of Garat allotment. The current total permitted use for livestock grazing in the Garat allotment is 29,766 animal unit months (AUMs)[68], of which 18,870 AUMs are active, , and 10,896 AUMs are suspended (Table ALLOT-5).

Table ALLOT-5: Total permitted use for individual permittee in the Garat allotment

Permittee	Active Use	Voluntary Non-use[1]	Suspension	Total
Petan Company of Nevada, Inc.	19,500	3,250	10,896	33,646

[1] In accordance with the 1989 management agreement which implemented the decisions of the 1986 Bruneau/Kuna Rangeland Program Summary, a reduction in authorized grazing use to 22,750 AUMs was implemented, of which 19,500 is active use and 3,250 AUMs is voluntary non-use.

The grazing season established within the current grazing permit is from March 15 through September 30 for 3,150 cattle with additional flexibility at the end of the season to gather up to 250 head of cattle remaining on the allotment through October 15. The allotment is divided into six pastures identified in the

[67] See section 1.7 of this EA for ORMP resource objectives or the ORMP (USDI BLM, 1999a).
[68] One animal unit month (AUM) is the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

1989 management agreement grazing schedule. Table ALLOT-6 identifies the current grazing schedule established in the 1989 management agreement.

Table ALLOT-6: Garat allotment grazing schedule implemented in the 1989 management agreement

Pasture	Pasture Name	Year 1	Year 2	Year 3
1	Dry Lake	3/15-6/15	Rest	3/15-6/15*
2	Piute Creek	3/15-6/15	Rest	3/15-6/15
3	Forty-Five	3/15-6/15	3/15-06/15	Rest
4	Kimball	Rest	3/15-6/15	3/15-6/15
5	Big Horse **	8/1-9/30	8/1-9/30	6/16-9/30
6	Juniper Basin **	6/16-9/30	6/16-9/30	6/16-9/30

* Will be used 3/5-5/30 with 500-1,000 head on old feed (NW Corner).
** Flexibility for strays 10/1-10/15

3.5.11.2 Direct and Indirect Effects

Table SOCE-13 below shows the change in AUMs for each alternative on the Castlehead-Lambert allotment and the value of those changes. These values assume that the animals use all of the active use AUMs authorized. In the table, the net annual effect—which is equal to the dollar value of the change in total AUMs plus or minus the resulting difference in grazing fees—represents the market value of the change in AUMs for hypothetical livestock operations. It should not be construed as an estimate of the actual economic impact on actual individual ranches within the study area. Ranchers have a wide range of options available to them in terms of how they respond to changes in the permitted number of AUMs on their range allotment(s). Depending on the length of their allowed grazing season and the specific change in permitted AUMs, a rancher might choose to increase or decrease herd size, change grazing months, retain or sell animals at their headquarters, lease new ground or cancel one or more leases on private rangeland, switch to irrigated pasture, adjust feed lot contracts, completely change operation types, and so on. Given the number of uncertain variables and the range of possibilities, it is not feasible to anticipate how individual ranches will react to changes in their specific grazing permits. Also unknown are any and all associated business decisions made in response to prevailing markets, federal and state agricultural policies, and personal values.

BLM acknowledges that as a result of any changes in permitted AUMs, there are likely to be multiplier effects within the economy that serves the associated ranching community. Because it is not possible to quantify the specific monetary impacts on individual ranches, it is also not possible to accurately estimate the resulting multiplier effects. It is possible, however, to state qualitatively, for example, that a reduction in AUMs would result in a corresponding reduction in regional economic activity if ranches choose to reduce herd numbers and then in turn reduce their spending within the regional economy. The converse is also true (see this related discussion in Section 3.3.1.6 above).

Table SOCE-13: Value of change in AUMs for each alternative, based on 10-year market value*

Alternative	% Change in AUMs	Change in Total AUMs	Total AUMs in Alternative	Annual Dollar Value of Change	Net Annual Effect (Dollar Value of Change +/- Difference in Grazing Fees)
1 (Current Situation)	0%	0	18,870	$0	$0
2	21%	3880	22,750	$49,160	$43,922
3	3%	630	19,500	$7,982	$7,132
4	-45%	-8527	10,343	-$108,037	-$96,526
5 (No Grazing)	-100%	-18870	0	-$239,083	-$213,608

*Ten-year Average Market Value of Forage per AUM in Idaho, 2002 - 2011 (non-irrigated private ground): $12.67

3.5.11.2.1 Alternative 1 Effects

Implementation of Alternative 1 would retain authorized levels of grazing use at the maximum level used by the permittee in recent years but reduce the authorized level by 3 percent from active use identified in the current permit. Active use would be reduced by a total of 3,880 AUMs – 630 plus the complete elimination of 3,250 voluntary non-use AUMs. A total of 18,870 AUMs would be active and support grazing for 2,955 head of cattle from March 15 through September 30 annually. Flexibility would be provided to gather up to 250 head of cattle through October 15. The allotment would also provide forage for 15 head of horses from March 15 through September 30. Grazing use would be authorized in the six pastures of the allotment between 7.0 and 15.5 acres per AUM, utilizing upland forage resources between pastures relatively equally although influenced by water availability and ease of livestock management. This equitable division of use among pastures would retain a moderate level of grazing use within the allotment. Livestock moves between pastures would continue with turnout near the northern portion of the allotment and requiring trailing through pastures scheduled for use later in the season. Livestock moves through the grazing season would be generally southward, ending the season in pasture 6 near the Nevada state line and recognized base property supporting the permit. The grazing schedule would retain flexibility in scheduled use of pasture 5, a pasture with limited late-season livestock water, by overlapping the time of its use with pasture 6. The schedule would support ease of moving livestock off the allotment at the end of the grazing season by maintaining pasture 6 as the last scheduled for use in all years. Flexibility in the grazing schedule, as indicated in recently reported actual use (Appendix B), would continue to provide for within-year adjustments in response to climatic conditions, livestock management needs, and natural events like wildfire. The flexibility in grazing schedules could require more active livestock management on the part of the operators, which means that either the operator would have to spend more time herding and moving animals, or they might need to hire another person. The earlier off-date (September 30 in this alternative, compared to October 15 in the current permit) means that the operator would have to move the animals back to the ranch, where they would graze or be fed hay for an extra 2 weeks. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above.

Costs incurred by the ranchers, such as those for alternative forage or feed, would likely be minimal because the AUMs proposed under Alternative 1 are the same as reported actual use in 2006, so the operators have managed livestock at these levels and paid the same amount for active use AUMs at some time in the recent past; the change in permitted AUMs would likely have little or no socioeconomic impact on their operations. The ranch would continue contributing to employment and the purchase and sale of goods and services. Under Alternative 1, the active use AUMs authorized would translate to more than $1.26 million to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above), assuming that the per-AUM contributions to the economy would be similar to those in Owyhee County.

3.5.11.2.2 Alternative 2 Effects

Implementation of the applicant's proposed action would result in an initial increase of active grazing use by 21 percent compared to Alternative 1 and potential to increase active grazing use by 78 percent over a 20-year period. This alternative maintains the currently permitted 22,750 active use AUMs, which is an increase of 3,880 active use AUMs over the maximum AUM use reported in 2006. Compared to Alternative 1, this alternative also authorizes 567 additional cattle and 10 additional horses to graze on this allotment. Initially, a total of 22,750 AUMs would be active and support grazing for 3,522 head of cattle from March 13 through September 15 annually, increasing opportunity for higher livestock sales and ranch income when compared to Alternative 1. Flexibility to gather 250 head of cattle at the end of the grazing season would continue to be provided. The allotment would also provide forage for 25 horses from March 14 through October 14. Greater flexibility would be provided to adjust livestock move dates among pastures in response to climatic conditions, livestock management needs, and natural events like wildfire. The revisions to the grazing schedule, with flexibility incorporated, would result in greater opportunity for equitability of grazing use of all pastures. Implementation of protocols for cooperative long-term and short-term monitoring to evaluate opportunity for periodically adjusting authorized active grazing use while ensuring that management objectives are met, would provide greater stability of authorized grazing equal to or greater than current levels. After-the-fact grazing billing would increase alignment between actual and billed grazing use by allowing payment for only that portion of the active grazing authorization use annually and would allow payment at the end of the late grazing season. Under Alternative 2, the active use AUMs authorized would translate to more than $1.52 million to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above) , assuming that the per-AUM contributions to the economy would be similar to those in Owyhee County.

3.5.11.2.3 Alternative 3 Effects

Implementation of the performance-based alternative would increase authorized levels of grazing use by 3 percent as compared to the levels authorized in Alternative 1, although retain authorized levels identified in current permits. A total of 19,500 AUMs would be active and support grazing for 3,054 head of cattle from March 15 through September 30 annually, retaining opportunity to support ranch income at current levels and greater than activated by the permittee in recent years. Flexibility to gather 250 head of cattle at the end of the grazing season would continue to be provided. The allotment would also provide forage for 15 head of horses from March 15 through September 30. The grazing rotation between pastures of the Garat allotment would be unchanged from the current rotation and the same as the rotation discussed in Alternative 1.

As noted in the Effects Common to All Allotments section, the operators are given specific requirements for stubble height and vegetation utilization, and they will have flexibility in adjusting livestock numbers, as long as they stay within these sideboards. Due to this flexibility, it is not possible to provide an accurate analysis of the specific socioeconomic effects from Alternative 3, but the possible effects can be estimated based on known costs and benefits for livestock, labor, machinery, and other investments that may result from possible management choices. The operation would also need to purchase additional feed and pay for additional labor needed to manage the animals. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above. Under Alternative 3, the active use AUMs authorized would translate to more than $1.3 million to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above) , assuming that the per-AUM contributions to the economy would be similar to those in Owyhee County.

However, as noted in the Effects Common to All Allotments section above, the operator might find that it is not possible to graze on the federal allotment for the entire length of the grazing season and still remain within the terms and conditions of the permit. In this case, the amount of forage available to permittees would be less than under Alternative 1 and, as a result, the economic contribution of grazing on this allotment would decline compared to Alternative 1. In order to maintain operations at the same level, operator(s) would need to identify alternative forage or feed. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above. If operators do not identify another source of forage or feed, operation levels might need to be reduced. With or without an alternative source of forage or feed, the overall economic contribution of the ranching operations to the regional economy could decline.

3.5.11.2.4 Alternative 4 Effects

Implementation of the season-based alternative would decrease levels of grazing use by 45 percent when compared to Alternative 1. A total of 10,343 AUMs would be active and support grazing for 1,604 head of cattle from March 15 through September 30 annually, reducing opportunity for livestock sales and ranch income when compared to Alternative 1. Active use would be reduced by 8,527 AUMs; this alternative also authorizes 1,351 fewer cattle to graze on this allotment than in Alternative 1. The permittee would continue to have flexibility to gather 250 head of cattle at the end of the grazing season. The allotment would also provide forage for 15 head of horses from March 15 through September 30. Although the grazing schedule would restrict grazing use to specific pastures from turnout in March through the end of the growing season in late June. Flexibility would be provided through the remainder of the grazing season to adjust livestock move dates between pastures in response to climatic conditions, livestock management needs, and natural events like wildfire. The revisions to the grazing schedule, with flexibility incorporated, would result in greater opportunity for equitability of grazing use all pastures. Flexibility to graze pasture 5 concurrent with any of the three pastures scheduled to be grazed in the deferred-rotation system, while also retaining no more than 1 in 3 years of active growing season use, would retain options for livestock management needs. The grazing schedule limits the need to intensively manage mid to late-season livestock use in pastures adjacent to portions of the Owyhee River canyon to reduce the likelihood of cattle movement into the canyon, areas outside the allotment. These actions are intended address concerns with the allotment not meeting rangeland health standards and ORMP objectives. The operator would have to either move these animals to state or private land or sell them.

Under Alternative 4, the active use AUMs authorized would translate to an estimated $692,000 to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above) , assuming that the per-AUM contributions to the economy would be similar to those in Owyhee County. However, due to the reduction in AUMs and change in grazing schedule, Petan Co. might need to adjust operations. If the operator is not able to find an economically feasible option for managing all or some of the animals and chose to close completely, the socioeconomic impacts would be the same as if the grazing permit were not renewed. The impacts of that action are outlined in Alternative 5 below.

3.5.11.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would eliminate public land grazing within the Garat allotment for 10 years, resulting in a disruption in current livestock management for the permittee. No permit would be offered with implementation of the no-grazing alternative and existing suspension AUMs would not be carried forward.

Because the operation uses public land forage to support a cattle herd for approximately 6 months of a year-round plan, limiting the operations to base property only or the permittee’s needs to supplement forage production from alternate forage sources would result in substantial changes to operations, potentially including additional planning and administration cost.

The decision not to renew the grazing permit for a period of 10 years could be detrimental to the continuing operation associated with this allotment because they might not be able to graze their livestock elsewhere for the same cost in grazing fees that they currently pay and on-ranch feed costs could be substantial. The socioeconomic impacts from closing this ranch are described in the Effects Common to All Allotments section above; the removal of the 3,020 AUMs that are authorized in Alternative 1 would be associated with more than $202,000 that is ranch would no longer contribute to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above), assuming that the per-AUM contributions to the economy would be similar to those in Owyhee County.

3.5.11.3 Cumulative Effects

The scope of this analysis covers Owyhee County, ID, Malheur County, OR, and Elko County, NV, because although the Owyhee Field Office has jurisdiction only over the allotments within the Owyhee Resource Area, the ranchers applying for livestock grazing permit renewals maintain base ranches near Jordan Valley, Oregon, and Tuscarora, Nevada. Actions taken regarding grazing permit renewals will affect the socioeconomic conditions in these counties because they influence decisions the operators make regarding their ranches. There are 135,116 active use AUMs permitted in Owyhee County (USDI BLM, 1999a), 407,473 active use AUMs permitted in the Malheur and Jordan Resource Areas in Oregon (USDI BLM, 2002a), and 305,247 AUMs in Elko County (USDI BLM, 1987). Based on estimates from Darden et al (see Section 3.3.1.6 above), which are for Owyhee County, Idaho, but are applied here to the entire three-county area, the total active use AUMs here contribute more than $56.7 million to the local economy.

For Alternatives 1-4, as long as the ranches remain in business, they will continue contributing to employment and the purchase and sale of goods and services in the local areas, and community cohesion will be maintained. For Alternative 5, not renewing the permits would mean that the BLM would no longer be contributing to the ranching community by providing grazing land, and if the ranches chose to close, the operators would no longer be contributing to employment or the purchase and sales of goods and services in the community. The U.S. government would continue contributing to the county through payments in lieu of taxes (PILT). Ranching plays a large role in all three counties, so although the loss of the Petan Co. of Nevada ranch could have a substantial impact on the local communities, the loss, which is small in proportion to the total livestock operations' contributions to the three-county area, likely would not have a cumulative effect on a larger scale.

3.5.12 Cultural/Paleontological Resources

3.5.12.1 Affected Environment

The Garat allotment is the largest allotment in the Owyhee Field Office. Fifteen project-related cultural resources surveys have been conducted within the allotment, totaling 224 acres, or less than 1 percent of the public land within the allotment. A 1985 survey contracted by the BLM for the Garat fire rehabilitation project covered 4,493 acres, but is not included in the total because the contractor used 200-meter (⅛-mile) transect widths to complete the inventory. Current standards require transect intervals to be no wider than 30 meters. The survey recorded one lithic scatter and one isolated artifact.

There are 39 recorded sites in the allotment, and they vary from historic structural remains to aboriginal lithic and stone tool scatters. The current site density on public land is one site per 5,195 acres (8.1 square miles). Twenty-one sites are of undetermined NRHP eligibility status, 17 are eligible, one is not eligible and no sites are listed on the NRHP. Of 115 range improvements reported to have occurred on the allotment, nine have been inventoried and 82 are potential livestock congregation areas. A 50-meter radius around a potential area of disturbance is considered sufficient to analyze impacts caused by congregation, and there are no sites located within 100 meters of these areas. Seventeen of the original site recordings (44 percent) mention trampling or grazing activities as an impact to the site; however, no explanation of the nature or level of the impacts is given. None of the sites on the Garat allotment have been monitored since their initial recording and their current conditions are unknown. Sites with reported impacts will be revisited and assessed for any existing and on-going disturbances. Range improvements constructed prior to the passage of the NHPA will be surveyed for culturally sensitive areas. Mitigation and protective measures for significant sites could include fencing, removal or decommissioning of range improvements, suspension of grazing or other approved actions.

Affected Environment – Paleontology
Current geologic information about fossil bearing strata for the Garat allotment is incomplete. Only a narrow, intermittent corridor at the western boundary running along and above the Owyhee River is reported to be of the Glenns Ferry Formation. By extension, the rest of the allotment is likely on the same formation. There are no recorded fossil discoveries within the allotment.

3.5.12.2 Direct and Indirect Effects

3.5.12.2.1 Alternative 1 Effects

Alternative 1 would renew the grazing permit under the terms and conditions of the expiring permit. Stocking levels and seasons of use would remain the same and no range improvements or other projects are proposed. This alternative serves as the baseline for comparisons to the other alternatives.

The season of use can begin as early as March 15 in four of six pastures. Soils are more likely to be saturated from snow melt and runoff and this can cause greater compaction, displacement and transport away from a site's matrix. Artifacts and features can be disturbed or destroyed at deeper depths and temporal deposition can become intermixed. As soils dry, impacts from trampling lessen, but areas that entice animals to gather still pose a risk to cultural resources. The intensity of these impacts would increase at these livestock congregation areas and surrounding areas up to 50 meters. There are no recorded sites known to be within a 100-meter vicinity of livestock congregation areas in the Garat allotment.

3.5.12.2.2 Alternative 2 Effects

Under this alternative, the grazing season would begin as early as March 13 in five of six pastures. Active use AUMs would increase 21 percent immediately and, if rangeland objectives are met, AUMs could potentially rise 78 percent above the baseline over a 20-year period. The impacts associated with an early spring turnout are discussed in Alternative 1, but the threat potential to cultural sites could rise appreciably with the increase in livestock if new congregation areas are created near recorded or undiscovered site locations. A significant rise in the number of animals can exacerbate the effects of trampling to cultural properties if they are not well dispersed.

3.5.12.2.3 Alternative 3 Effects

A 3 percent increase in active use AUMs and the same season of use, as in Alternative 1, are proposed. The increase in livestock is minimal and the impacts would be the same as in Alternative 1.

3.5.12.2.4 Alternative 4 Effects

Seasonal restrictions and a 45 percent reduction in active use AUMs can moderate any livestock impacts to cultural resources. A decrease in livestock could mitigate the amount of trampling some sites may experience and any recovery of vegetation could alleviate the effects of erosion and provide better cover to deter illegal collecting. Sites located at congregation areas would still be subjected to a possibility of damage and disturbance and would need to be monitored and protected, if necessary.

3.5.12.2.5 Alternative 5 Effects

Cultural resources would not be impacted by livestock under a no-grazing alternative. Sites would still be subjected to weather, wildlife, fire, and other natural processes, but these types of impacts have been occurring since the sites were first formed and are generally minor in their overall effects. Artifact collecting and other human-caused disturbances would continue, but if ground cover increased from a lack of foraging and trampling, cultural material could be better hidden and protected.

3.5.12.3 Cumulative Effects

The scope of analysis for the Garat allotment is considered to be the allotment boundaries. The range of known site characteristics is similar to those in the surrounding areas and the allotment is not part of an historic district under which sites could have a contributing element potential. Any site that is eligible for the NRHP or is of an undetermined status is managed for preservation and protection. There are no recorded or known Traditional Cultural Properties within this allotment.

3.5.12.3.1 Alternatives 1-4 Effects

In general, past impacts to cultural sites may include unsurveyed range improvements, animal congregation and artifact collecting. No recent monitoring of sites in the Garat allotment has occurred to document impacts. Currently, all undertakings must be inventoried and managed for the protection of eligible sites and those of undetermined status in compliance with Section 106 of the NHPA. Ephemeral areas recognized as potential threats to sites, like salt block locations and wallowing spots, will be surveyed as they become known. Site looting is an ongoing threat that is very difficult to control and will remain a problem into the future; however, no reports of illegal excavations in the allotment are known to have been made during the past 10 years. Since there are no range improvements proposed under these alternatives and since there are no other undertakings planned for the general area that would affect cultural resources, significant cumulative impacts are not expected under this alternative.

3.5.12.3.2 Alternative 5 Effects

Past impacts to cultural resources are explained above; however, due to the absence of livestock and any proposed ground disturbing projects, cumulative impacts would not occur under this alternative.

3.6 Swisher Springs Allotment (0450) and Swisher FFR Allotment (0637)

3.6.1 Rangeland Vegetation, Including Noxious Weeds and Invasive Plants

3.6.1.1 Affected Environment

The Rangeland Health Assessment and Evaluation Report for Swisher Springs and Swisher FFR allotments were completed in 2012 (USDI BLM, 2012c). The assessment and evaluation report identifies that the Idaho Standards for Rangeland Health Standard 4 – Native Plant Communities was met in both allotments. The assessment and evaluation report also identified general short-term and long-term downward trends in the frequency of desirable native bunchgrass species (bluebunch wheatgrass, Idaho fescue, and Thurber's needlegrass). There is no trend plot in the Swisher FFR allotment. Downward trend in the Swisher Springs allotment is from an ecological condition depressed from the identified site potential or desired in the ORMP vegetation objective. Although that depressed ecological condition was found to be largely a product of grazing management practices in the late 1800s and early years of the 20th century, as well as a product of altered fire return intervals resulting in the encroachment by juniper trees into sagebrush steppe vegetation communities (National Research Council, 1994) (Appendix K), recent trends in the frequencies of desirable native perennial bunchgrasses do not indicate progress toward improved ecological conditions. State-and-transition models for big sagebrush/bunchgrass and low sagebrush/bunchgrass vegetation communities within the Swisher Springs allotment identify opportunity to restore desirable perennial bunchgrass health and vigor with implementation of proper livestock grazing management practices when past actions have not resulted in transition to a new and less-productive state (USDA NRCS, 2010).

Recent implementation of alternate-year deferment of grazing use until after the active growing season for native perennial bunchgrass species[69] within two of the three pastures of the Swisher Springs allotment do not provide adequate deferment or rest to achieve ORMP management objectives. A number of sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season and providing at least two years of deferment for every year of active growing season use (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012).

Ecological sites and vegetation condition

The vegetation types and ecological sites for public lands within the northern portion of Owyhee Field Office, including Swisher Springs and Swisher FFR allotments, were described in a vegetation inventory and analysis (1977-1979) using methodologies described in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980). Ecological site potential and succession, as well as an introduction to state-and-transition models for low sagebrush/bunchgrass and big sagebrush/bunchgrass ecological sites, is provided in the vegetation Affected Environment section of this NEPA document for Owyhee River allotments. Table VEGE-12 provides a listing of ecological sites described, a summary of dominant potential vegetation, and acreage for the Swisher Springs and Swisher FFR allotments (Map ECOL-3).

Table VEGE-12: Ecological sites mapped for the Owyhee Field Office, Swisher Springs and Swisher FFR allotments

Ecological Site	Dominant Species Expected	Acres [1]	Percent of Allotment
Swisher Springs Allotment			
[2 3] Shallow claypan 12-16” ARAR8/FEID	low sagebrush, Idaho fescue	2,578	70
[3] Very shallow stony loam 10-14” ARAR8/POSA-PSSPS	low sagebrush; Sandberg bluegrass-bluebunch wheatgrass	24	<1
[2 3] Loamy 13-16” ARTRV/PSSPS-FEID	mountain big sagebrush; bluebunch wheatgrass-Idaho fescue	1,092	30
Total		3,694	100
Swisher FFR Allotment			
[2 3] Shallow claypan 12-16” ARAR8/FEID	low sagebrush; Idaho fescue	781	100

[1] Acreage includes all ownerships.
[2] Ecological site descriptions identify a state-and-transition model with increasing Sandberg bluegrass resulting from improper grazing management which if continued and with fire can retrogress through phases and could transition to a new grazing resistant state with Sandberg bluegrass and cheatgrass as the understory dominant. (100 percent of acres within each allotment: Swisher Springs and Swisher FFR allotments)
[3] Ecological site descriptions identify a state-and-transition model with potential for juniper encroachment. (Percent of acres within each allotment: Swisher Springs 100%; Swisher FFR 100%)

[69] The active growing season for bluebunch wheatgrass and Idaho fescue within vegetation communities of the Swisher Springs allotment is May 1- July 1, a period when decreasing soil moisture does not provide opportunity for regrowth before the dormant period.

In addition to mapping ecological sites listed in Table VEGE-12 above, the vegetation inventory for public lands in the Owyhee Field Office completed in the late 1970s included the assessment of range condition classes. Range condition class data are summarized for public land which includes the Swisher Springs and Swisher FFR allotments in the Owyhee Grazing Environmental Impact Statement Draft (USDI BLM, 1980). These data were updated and ecological condition was reported by allotment in the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement (USDI BLM, 1999b). Ecological condition is based on a similarity index which compares the plant community present to the historic potential natural community for that ecological site. The similarity index to the historic climax plant community is the percentage by weight of annual production of plant species present at the inventoried site. Table VEGE-13 is a summary of ecological condition within the Swisher Springs and Swisher FFR allotments from locations sampled during the vegetation inventory completed in the late 1970s and updated during development of the ORMP (USDI BLM, 1999a).

Table VEGE-13: Ecological condition for public lands in Swisher Springs and Swisher FFR allotments

Allotment	**Ecological Status (Acres / Percent)**				
	Early Seral	**Mid-Seral**	**Late Seral**	**Potential Natural Condition**	**Treated Lands** [2]
Swisher Springs Allotment (0450)	924 / 25	2,401 / 65	396 / 10	0 / 0	0 / 0
Swisher FFR Allotment (0637)	143 / 95	8 / 5	0 / 0	0 / 0	0 / 0

[1] Ecological status is based on a similarity index to a reference community, in most cases the historic climax plant community or potential natural community. A similarity index of 0-25% is early status; A similarity index of 26-50% is mid status; A similarity index of 51-76% is late status; A similarity index of 77-100% is potential natural community.
[2] Treated lands include those where brush control treatments or seedings preclude classification within one of the conditions classes.

Vegetation inventory production data from the late 1970s indicate that many sagebrush/bunchgrass communities within the Swisher Springs and Swisher FFR allotments were less productive than the reference sites described in ecological site descriptions. These data reveal that the majority of sites sampled exhibited a reduced dominance by deep-rooted bunchgrasses and a commensurate increase in sagebrush, shallow-rooted grasses, or both[70]. Localized areas may have crossed the threshold to the identified states dominated by Sandberg bluegrass, squirreltail, annual grasses, and annual forbs in the understory, with or without sagebrush or root-sprouting shrubs such as rabbitbrush in the shrub layer, as a result of historic improper livestock grazing and/or altered fire return intervals. The vegetation shift away from the reference plant communities noted for the Swisher Springs and Swisher FFR allotments likely occurred in the late portion of the 19th century and the early years of the 20th century, a period when public-land livestock grazing was controlled little and stocking rates were high (Vavra, Laycock, & Pieper, 1994).

Additionally, current vegetation in the Swisher Springs and Swisher FFR allotments [based on mapping done by the Pacific Northwest National Laboratory (PNNL) from 2000/2001 Landsat satellite imagery and updated for vegetation treatments and fire] is shown in Table VEGE-14.

[70] Analysis of production data is on file in the project record and is available to the public upon request

Table VEGE-14: Current Vegetation in the Swisher Springs and Swisher FFR allotments (based on PNNL data as updated)

Vegetation Cover Type	Acres	Percent of Allotment
Swisher Springs Allotment		
Juniper	133	4
Mountain big sagebrush	646	17
Basin/Wyoming big sagebrush	152	4
Low sagebrush	1,742	47
Bunchgrass	953	26
Bitterbrush	6	<1
Rabbitbrush	7	<1
Wet meadow	20	1
Mountain shrub	33	1
Exotic annuals	0.4	<1
Sparse veg	0.2	<1
Total:	**3,693**	**100%**
Swisher FFR Allotment		
Juniper	54	7
Mountain big sagebrush	160	20
Basin/Wyoming big sagebrush	168	21
Low sagebrush	341	44
Bunchgrass	2	<1
Bitterbrush	13	2
Wet meadow	31	4
Mountain shrub	12	2
Rabbitbrush	0.4	<1
Aspen	0.2	<1
Total:	**781**	**100%**

The differences between potential vegetation mapped in ecological site inventories and the current vegetation identified in PNNL data are indicated by comparing Tables VEGE-12 and VEGE-14. Ecological site and PNNL mapping were completed at different scales and with different vegetation classification systems. Precise comparison of the two tables is not possible, but general differences in plant community structure and composition are apparent between potential vegetation and current vegetation. In general, juniper is currently the dominant component of a portion of the landscape in the Swisher Springs allotment and occurs more common than is present at site potential in Swisher FFR allotment. Current juniper dominance within some ecological sites can be compared to the limited presence as small inclusions within vegetation communities which at potential would support dominant mountain shrubs, mountain big sagebrush, or low sagebrush in the shrub layer, and native perennial bunchgrasses and forbs in the understory (Table VEGE-14). Ecological site descriptions for the Swisher Springs and Swisher FFR allotments identify that juniper have the potential to invade all ecological sites in the two allotments. Ecological site descriptions also identify that potential for juniper dominance of the vegetation community is limited to new states in the state-and-transition models.

Other than the encroachment by juniper, past disturbances are less evident when comparing the two tables. Past fires and other disturbances indicated by the presence of exotic annuals, bunchgrasses communities lacking a significant shrub component and the dominance of green rabbitbrush in the current vegetation do not differ greatly from site potential.

Potential forage production

The estimated average annual production of forage species in the Swisher Springs allotment is 423 pounds of grass and grass-like species per acre in the normal year, based on ecological site descriptions listed in site guides (USDA NRCS, 2010) and the proportion of each ecological site represented in the allotment. The amount of forage necessary to support one AUM is 1,000 pounds and the maximum allowable utilization limit of 50 percent[71]; thus approximately 4.7 acres would be required to support one AUM, assuming all ecological sites in the allotment were at site potential and livestock distribution were equal throughout the allotment. Similar calculations for the Swisher FFR allotment result in an estimated average annual production of 325 pounds of grass and grass-like species per acre in the normal year, and approximately 6.2 acres would be required to support one AUM. Conservative stocking is a term commonly used by range researchers to define a level of grazing between light and moderate, generally involving about 30-40 percent use of forage (Appendix M). When one limits the maximum allowable utilization to 35 percent, approximately 6.8 acres would be required to support one AUM in the Swisher Springs allotment and approximately 8.8 acres would be required to support one AUM in the Swisher FFR allotment, assuming ecological condition was at reference site conditions and with equal livestock distribution throughout the allotment.

Vegetation inventory data recorded for the Swisher Springs and Swisher FFR allotments in the late-1970s identify that the ecological condition at many inventoried sites sampled was largely influenced by the presence of shrub species with a reduced dominance by deep-rooted bunchgrass species. Although recent fire has reduced sagebrush and juniper dominance on large portions of the allotment, deep-rooted bunchgrasses have not recovered to site potential (USDI BLM, 2012c). The remaining presence of sagebrush and the greatly reduced occurrence or dominance by native perennial bunchgrass species, the primary forage species supporting authorized levels of livestock grazing, is reflected in the early to mid-ecological condition recorded for the majority of the allotments. As a result, the lack of the potential co-dominance by native bunchgrass species greatly reduces the production of forage from the allotment as compared to ecological site potential. In addition, livestock do not equally distribute grazing use throughout any pasture, resulting in areas of lighter use and areas of heavier use.

Conclusion

To summarize, the Swisher Springs and Swisher FFR allotments are meeting the Standard for Native Plant Communities (Standard 4). Downward trend in the frequency of bluebunch wheatgrass and Idaho fescue in the herbaceous understory of vegetation communities, which was recorded in the 2012 Rangeland Health Assessment and Evaluation Report for Swisher Springs (USDI BLM, 2012c), led to a conclusion that the ORMP vegetation management objective to maintain or improve ecological condition was not met. Vegetation communities have shifted to a greater dominance of shallow-rooted native perennial bunchgrass species and nonnative annuals and a decline in larger deep-rooted native perennial bunchgrasses.

Weeds

In Idaho, the BLM works closely with the Idaho Department of Agriculture, Tribal governments, and county governments to combat noxious weeds. Cooperative weed management arrangements utilize local, state and Federal resources to inventory and treat weed infestations on both public and private lands. Populations are recorded, treated, monitored, and retreated as their presence is known. Undiscovered noxious weeds may also exist. Identified weeds within Swisher Springs, Swisher FFR, and adjoining

[71] A management action listed in the ORMP to meet the livestock grazing management objective is to limit upland forage utilization by livestock on key herbaceous forage species to 50 percent unless a higher or lower level of use is appropriate to meet standards for rangeland health.

allotments are limited to sites of whitetop located along roads. Noxious weed control is ongoing in this area.

Invasive annual species, including cheatgrass and a number of nonnative annual forbs are present in the Swisher Springs and Swisher FFR allotments, as noted in the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012c), but do not dominate in any areas.

3.6.1.2 Direct and Indirect Effects

Analyses of the Current Situation alternative, the applicants' proposed action, and Alternatives 3 through 5 are based on consequences of seasons and intensities of livestock grazing use provided in earlier sections of the EA and Appendix M, including the vegetation Affected Environment section for the Owyhee River group of allotments (Rangeland Vegetation Section 3.3.1.1) and the vegetation Affected Environment section for the Swisher Springs and Swisher FFR allotments (Rangeland Vegetation Section 3.6.1.1). In addition, Appendix M provides ecological concepts for expected vegetation change resulting from livestock management practices.

3.6.1.2.1 Alternative 1 Effects

Implementation of Alternative 1 would continue current livestock management actions for the Swisher Springs allotment, only differing from terms and conditions of current permits with a small reduction of livestock numbers and the resulting reduction of active AUMs authorized. The Idaho rangeland health standard for native plant communities within the Swisher Springs and Swisher FFR allotments would continue to be met. Livestock management practices would lead to continued downward trend in frequency of deep-rooted native perennial bunchgrasses and contribute to not meeting the ORMP management objective for vegetation.

Seasons of grazing use

Livestock grazing results in selective removal of more palatable plants and portions of plants. The forage species preferred by livestock changes through the phenological stages of growth of the variety of species available, resulting in continued change in the plant species selected through the grazing period. As identified in Appendix M, active growing season use has a great potential to impact vigor and health of bunchgrass species.

The pasture rotation scheduled for the Swisher Springs allotment under Alternative 1, 1 full year of rest from livestock grazing followed by 1 year of growing season use within pastures 1 and 3 of the Swisher Springs allotment, would result in preferred bunchgrass species, primarily bluebunch wheatgrass, frequently defoliated during the active growing season. The schedule would provide limited opportunity for recovery of bunchgrass vigor and health, less than the needs of bluebunch wheatgrass recommended by a number of sources (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012). These sources recommend no more than 1 of 3 years grazing during the active growing season. Native perennial plants would not be able to fully express growth or improve vigor, nor would adequate opportunity for regeneration and establishment of new individuals be provided in vegetation communities, under this alternative.

Annual grazing use of pasture 2 in the Swisher Springs allotment between July 16 and October 31 would defer use to a period outside the active growing season in most years and allow full expression of growth and vigor with opportunity for regeneration and development of new individuals in vegetation communities.

Custodial authorization of grazing in the Swisher FFR allotment would not include the defined seasons of use, although it would limit use of public land to 15 AUMs. Limited public land within the allotment and the location of public land in portions of the allotment away from areas of livestock concentration would lead to lighter grazing use of native perennial species, as compared to the private land portions of the allotment.

Intensity of grazing use

Under Alternative 1, authorized active use would be reduced by 7 percent in the Swisher Springs allotment. Past stocking rates, as carried forward in Alternative 1, are not expected to result in negative impacts to vegetation resources due to utilization levels, because recorded utilization levels at reported stocking rates have been in the slight (6 to 20 percent) and light (21 to 40 percent) levels, with limited exceptions. The scheduled grazing use and livestock numbers identified in Alternative 1 result in approximately 11.5 public land acres in the Swisher Springs allotment used to support one AUM, including acreage of pastures scheduled for rest in the rotation. The number of acres within individual pastures of the Swisher Springs allotment scheduled through the 2-year rotation of Alternative 1 to support one AUM is greatest at 9.3 acres in pasture 1 during year one and the least at 6.7 acres in pasture 3 in year two. Stocking rates are near expected carrying capacity with the authorization proposed at 6.7 to 9.3 acres per AUM, as compared to the calculated 6.8 acres required to support one AUM in the Swisher Springs, under ideal conditions with ecological condition at site potential and with equal livestock distribution throughout the allotment.

Livestock numbers authorized in Alternative 1 for the Swisher FFR allotment, unchanged from the current permit, result in approximately 10.2 public land acres used to support one AUM. No utilization data are available for the Swisher FFR allotment.

Juniper encroachment

Recent wildfires have somewhat limited juniper dominance in the Swisher Springs allotment, resulting in juniper encroachment not being identified as a cause for failure to meet the Idaho Rangeland Health Standard for native plant communities. Other than the indirect effects from removal of fine fuels that support the spread of wildfire, recent livestock grazing has had little influence on juniper encroachment. Continuation of recent livestock management practices under Alternative 1 would have little influence on juniper encroachment.

Weeds

Alternative 1 also includes the continued risk of introducing noxious weeds and invasive species to public lands and increasing the spread of existing incursions. Although the presence of cheatgrass and other invasive annual species was identified in the 2012 Rangeland Health Assessment and Evaluation Report for this allotment (USDI BLM, 2012c), no location within the allotment was found to be dominated by these species.

Livestock may spread weeds and invasive species through transport on fur and on hoofs as well as through ingestion and later defecation of viable seeds. This transport can occur from sources used prior to scheduled use of public land, between sites within the allotment, or to locations outside the allotment at the end of the grazing season. Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel provides sites for establishment of weeds and invasive species. The level of risk associated with implementation of Alternative 1 is proportional to the number of livestock authorized to graze within the allotment and the concentration of soil disturbance. Alternative 1, which authorizes annual grazing use of 322 AUMs, would result in risk for introduction of weeds and spread of existing weeds equivalent to that risk with implementation of the applicant's proposed action, the performance-based alternative and the season-based alternative, because authorized levels of use would be similar. Risks of weed and invasive species introduction and spread associated with livestock management practices would be eliminated in the no-grazing alternative.

Conclusion

Although livestock grazing seasons of use and livestock numbers authorized in the Swisher Springs allotment with implementation of Alternative 1 would meet the Rangeland Health Standard for native plant communities, continuation of livestock management practices as identified in Alternative 1 would lead to static or continued downward trend in the condition of native vegetation communities, as documented in the 2012 Evaluation Report and Determination. Progress toward a full complement of native perennial species consistent with ecological site potential would not result. The native vegetation condition of pastures 1 and 3 of the Swisher Springs allotment, grazed in alternate years during the active growing season, would not improve, which would lead to the majority of the allotment remaining in early to mid-ecological condition. The ORMP management objective to improve unsatisfactory vegetation health/condition would not be met. In the absence of actions to reduce stressors to biotic function induced by livestock management practices, downward trend would be anticipated as a result of stressors induced by climate change, primarily altered precipitation and temperature regimes, and exacerbated by livestock management practices as identified above. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

Continued management of the Swisher FFR allotment in the custodial category with the flexible seasons of use and livestock numbers, grazed in association with the private land, would meet rangeland health standard for native plant communities. Grazing under Alternatives 1 through 4 will result in the same consequences to the vegetation on Swisher FFR.

3.6.1.2.2 Alternative 2 Effects

Implementation of the applicant's proposed action for the Swisher Springs allotment would result in no change to the grazing authorization as compared to the current grazing permit and an increase of active grazing use (allotment-wide stocking rate) by 7 percent when compared to Alternative 1. The consequences of implementing alternative 2 for the Swisher Springs allotment would be similar to those identified under the Current Situation alternative.

Seasons of grazing use

The grazing schedule in the applicant's proposed action is the same as in the current permit and Alternative 1. Analysis of the season of grazing use impacts to vegetation resources, including weeds, can be found in the discussion in Alternative 1.

Intensity of grazing use

The 7 percent greater active grazing use would result in utilization levels slightly higher than identified under Alternative 1. That would result in utilization levels that may exceed the light (21 to 40 percent) level at times, yet still remain less than levels in the moderate category and generally consistent with conservative stocking that results in the 30 to 40 percent level that is often recommended by range researchers (Appendix M). Analysis of the consequence of the stocking rate is similar to that analysis in Alternative 1. Stocking rates are near expected carrying capacity, with proposed authorizations of 6.2 to 8.7 acres per AUM, as compared to the calculated 6.8 acres required to support one AUM in the Swisher Springs under ideal conditions with ecological condition at site potential and with equal livestock distribution throughout the allotment.

Juniper encroachment and Weeds

Analysis of the consequences of implementing Alternative 2 on juniper encroachment and weeds does not differ from that contained in the analysis for Alternative 1.

Conclusion

Livestock grazing seasons of use and livestock numbers authorized in the Swisher Springs allotment with implementation of the applicant's proposed action would meet the Rangeland Health Standard for native plant communities, as noted in Alternative 1. Continuation of livestock management practices as identified in the applicant's proposed action would lead to static or additional downward trend in condition of native vegetation communities. Progress toward a full complement of native perennial species consistent with ecological site potential would not result. The native vegetation condition of pastures 1 and 3 of the Swisher Springs allotment, grazed in alternate years during the active growing season, would not improve, which would lead to the majority of the allotment remaining in early to mid-ecological condition. The ORMP management objective to improve unsatisfactory vegetation health/condition would not be met. In the absence of actions to reduce stressors to biotic function induced by livestock management practices, downward trend would be anticipated as a result of stressors induced by climate change, primarily altered precipitation and temperature regimes, and exacerbated by livestock management practices as identified above. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would not be provided.

3.6.1.2.3 Alternative 3 Effects

Although the performance-based alternative has the same season of use, livestock number, and AUM terms and conditions as Alternative 1, Alternative 3 also includes performance-based terms and conditions that limit the intensity of grazing use on upland vegetation, riparian resources, and special status species habitats. These performance-based terms and conditions would provide substantial improvement to native plant communities under this alternative when compared to current conditions. Though Alternative 3 does include a 7 percent increase in active use when compared to the Current Situation alternative, the stocking rate for the allotment would be equal to stocking rates identified in current permits to graze livestock in the allotment, and BLM determined that those stocking rates are not necessarily inconsistent with plant health. In addition, the performance-based terms and conditions (terms and conditions 11 through 13 on the permit) will protect and enhance native plant communities.

Under Alternative 3, the growing season utilization limits in upland vegetation communities would improve native perennial species health and vigor because the intensity of grazing use during the active growing season would be reduced and native perennial species would be allowed to complete the annual growth cycle with limited need to replace photosynthetic surface area mid-way through the growing season. Specifically, the utilization limit (≤20 percent), in addition to the indirect effects to upland vegetation resources of limiting the intensity of grazing use of riparian vegetation and vegetation that provided wildlife habitats, would allow the Idaho rangeland health standard for native plant communities and the ORMP vegetation management objective to be met long-term.

Seasons of grazing use

The grazing schedule identified under Alternative 1 would also be implemented under Alternative 3. The analysis of consequences to vegetation resources of implementing the seasons of use for each pasture of the allotment are presented for Alternative 1 above. Some sources (Holechek, Gomez, Molinar, & Galt, 1999) (Holechek, Thomas, Molinar, & Galt, 1999) identify the benefits of limiting stocking rates or utilization levels, rather than limiting grazing of bluebunch wheatgrass to no more than 1 in 3 years during the active growing season, or defining seasons of grazing use to allow grass species recovery and maintenance of health and vigor. Impacts from seasons of use under Alternative 3 would be similar to those identified for Alternative 1, although the combined effect of seasons and intensities of grazing use would differ, as discussed below and in Appendix M.

Intensities of grazing use

Implementation of the performance-based alternative in the Swisher Springs allotment would initially result in an increase of active grazing use by 7 percent compared to Alternative 1 but would implement stocking rates equal to those in the current permit to graze livestock in the allotment. These initial stocking rates of between 6.2 and 8.7 acres per AUM are near expected carrying capacity, as compared to the calculated 6.8 acres required to support one AUM under ideal conditions with ecological condition at site potential and with equal livestock distribution throughout the allotment. At the initial stocking rates and in the absence of changes to livestock management practices, utilization levels would be expected to exceed the 20 percent maximum allowable performance-based term and condition in pastures used during the active growing seasons. This conclusion is reached because recorded utilization of key species in pastures used during the active growing season in recent years has repeatedly exceeded 20 percent, as summarized in Appendix B.

Increasing the intensity of livestock management practices to retain utilization levels below the threshold of the performance-based term and condition during the active growing season would ensure that plants are used at a slight or lower level (≤20 percent). The reduction in growing season utilization levels from current levels (Table VEGE-5) to less than 20 percent equates to removal of a smaller portion of photosynthetically active leaf surface area and removal of fewer tillers. Limitation of the utilization level during the active growing season would reduce the need for native bunchgrasses to replace leaf material removed during the active growing season and the initiation of new tiller development midway through the active growing season. Interruption of photosynthetic capacity during the active growing season would be less impacted than under the higher utilization levels of Alternative 1. Limiting utilization to less than 20 percent would lead to fewer plants grazed during the boot stage, the more critical portion of the active growing season. As a result of reduced active growing season utilization levels, health and vigor and recovery of deep-rooted bunchgrass plants would be expected in pastures 1 and 3, both scheduled to be grazed during the active growing season in alternate years. Year-long rest scheduled 1 of every 3 years would additionally benefit the recovery of ecological status and health of native upland vegetation communities as identified in the Current Situation alternative.

Retention of the maximum allowable utilization limit of 50 percent for key species during grazing scheduled during periods outside the active growing season would retain sufficient standing senescent plant material and litter to protect soils from erosion and also protect soil properties, indirectly benefiting native perennial vegetation health and vigor.

Compliance with performance based terms and conditions for riparian resources and special status species habitat would also result in lower intensities of use of native perennial species. These terms and conditions may often limit grazing use in pastures where these resources are present before the 20 percent maximum allowable utilization level during the active growing season or the 50 percent maximum allowable utilization during periods outside the active growing season are reached.

Juniper encroachment and Weeds

The consequences of implementing Alternative 3 on juniper encroachment and weeds do not differ from those for Alternative 1.

Conclusion

The Idaho Rangeland Health Standard for native plant communities would continue to be met in the Swisher Springs allotment under Alternative 3. The condition of pastures 1 and 3, with limitations to utilization during the active growing season, would improve and lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. In the event that the growing season utilization limit was periodically exceeded over the 10-year term of the permit, but less often than the trigger of 2 in any consecutive 5-year period, static trend as documented in the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012c) may occur in the short term (1 year or less). However, as long as livestock management practices are implemented to meet the performance-based terms and conditions, native plant communities would improve in health and vigor over the life of the permit.

When livestock management actions under alternative three are considered against the grazing response index suggested by Reed and others (1999), the intensity of grazing use would be low, although the opportunity for frequent removal of leaves and tillers during the growing season (more than three times) and limited chance for regrowth following scheduled grazing use combine in 1 of 2 years of the grazing schedule to suggest less harmful impacts to plant health than under Alternative 1 or Alternative 2. The ORMP management objective to improve unsatisfactory vegetation health/condition would be met. The reduction of stressors to biotic function induced by livestock management practices resulting from the performance-based terms and conditions, primarily limiting growing season utilization levels, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.6.1.2.4 Alternative 4 Effects

The season-based alternative for the Swisher Springs allotment would implement a pasture rotation schedule that includes less frequent use during the critical growth period for pastures 1, 2, and 3, when compared to Alternatives 1 through 3. In other words, Alternative 4 would implement periodic deferment of grazing use to a period outside the active growing season or year-long rest more often than would occur with implementation of the other grazing alternatives. The decrease in the frequency of growing season use would allow native perennial species to complete the annual growth cycle more often in the absence of livestock grazing, allowing recovery of plant health and vigor. Additionally, Alternative 4 would result in a decrease of active grazing use by 34 percent, compared to Alternative 1, by reducing livestock numbers. The combined grazing schedule with less frequent active growing season use and reduced level of livestock use proposed in Alternative 4 would improve rangeland health to better ensure meeting Standard 4 and the ORMP management objective for vegetation over the term of the permit.

Seasons of grazing use

The grazing schedule identified under the season-based alternative would implement a scheduled 3-year rotation through pastures. The schedule would limit grazing use to 1 in 3 years during the active growing season (May 1 to July 1) in pastures 1 and 3. As identified in Appendix M, active growing season use has a greater potential to negatively impact health and vigor of bunchgrass species, compared to use during periods outside the active growing season. The pasture rotation scheduled under Alternative 4 for pastures 1 and 3 would result in palatable bunchgrass species, primarily bluebunch wheatgrass, being allowed to complete the annual growth cycle more often in the absence of livestock grazing. The absence of livestock grazing during the growing season in 2 of 3 years allows plants to continue their growth cycle without the allocation of photosynthate to replace grazed leaf material or to replace grazed tillers midway through the growing season.

Restrictions on the season of grazing use of pasture 2 to meet riparian management objectives limits its use to spring only (prior to July 1), a period that includes the active growing season for native perennial species. When restrictions on the season of use for improvement of upland vegetation are combined with seasons of use for riparian resources, pasture 2 is scheduled for the 3-year rotation with 1year of use during the active growing season followed by 2 years of rest. Similar to the deferment of grazing use in pastures 1 and 3 above, rest in 2 of 3 years would result in palatable bunchgrass species, primarily bluebunch wheatgrass, being allowed to complete the annual growth cycle more often in the absence of livestock grazing.

Scheduled deferment of grazing use to a period outside the active growing season for perennial bunchgrass species or year-long rest would occur in 2 years of every 3-year period in all three pastures and would provide opportunity for recovery of bunchgrass vigor and health consistent with recommendations by a number of sources (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (Brewer, Mosley, Lucas, & Schmidt, 2007) (USDA NRCS, 2012). The ability of desirable perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of desirable native bunchgrasses to compete with and delay the dominance by sagebrush species, in the absence of periodic natural fire, would be improved in years with limited soil moisture.

Intensity of grazing use

As a result of implementing restrictions to seasons of grazing use for pastures based on resources present within each pasture, Alternative 4 would result in a decrease of active grazing use by 34 percent when compared to Alternative 1. This reduction is largely the product of the seasons of use appropriate for meeting riparian objectives and the presence of riparian resources that would be managed with these restricted seasons. Pastures 1 and 3 also have season of use restrictions that also contributed to the reduced grazing use, in order to provide habitat for special status wildlife species. Stocking rates for pastures of the Swisher Springs allotment would vary through the grazing rotation between 10.1 and 21.6 acres per AUM under Alternative 4, compared to 6.7 to 9.3 acres per AUM under Alternative 1. The Alternative 4 stocking rates would be better supported by the level of forage produced by the early to mid-ecological condition of the allotment and with consideration for portions of each pasture that are less accessible for livestock grazing due to distance from water and topography. As a result, utilization levels in all pastures would be reduced proportionally from those under Alternative 1 presented above and those recorded in recent years. Lighter utilization levels would allow residual standing plant material and litter to better protect soils from erosion and support soil properties, indirectly supporting health and vigor of native perennial species. In addition, lighter utilization levels during the active growing season would reduce the need for native bunchgrasses to replace leaf material removed during the active growing season and the initiation of new tiller development midway through the active growing season. Photosynthetic capacity during the active growing season would be less impacted than under higher utilization levels of Alternative 1. As a result, the ecological condition of native upland vegetation communities would be expected to improve due to the proposed decreased stocking rate and resulting light utilization levels.

Juniper encroachment and Weeds

The consequences of implementing Alternative 4 on juniper encroachment and weeds do not differ from those for Alternative 1.

Conclusion

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use in the Swisher Springs allotment to meet resource objectives and with its reduction in livestock grazing use, would result in improved native perennial plant health and vigor. When livestock management actions under Alternative 4 are considered against the grazing response index suggested by Reed and others (1999), the likelihood for frequent livestock grazing of an individual plant during the growing season (more than three times) and little or no chance for regrowth following scheduled grazing use would be limited to 1 in 2 years, whereas the utilization level during the growing season would be light during that one year. This would result in the benefits to vegetation resources from livestock management practices that are similar to actions under Alternative 3 and the least harmful to plant health of all the grazing alternatives considered. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result the 10-year term of the permit. The ORMP management objective to improve unsatisfactory vegetation health/condition would be met. The reduction of stressors to biotic function induced by livestock management practices, primarily limiting the frequency of growing season use and reducing livestock numbers, would be anticipated to mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.6.1.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would provide a rate of recovery toward ecological site potential more rapid than other alternatives considered. In the absence of livestock grazing, growing season removal of photosynthetic material of native perennial species, including bunchgrass species that provide the majority of current forage for livestock grazing use, would be limited to use by native herbivores including insects. Limited growing season removal of photosynthetic material would allow bunchgrass species to complete their growth cycle annually without the need to allocate photosynthate to replace grazed leaf material or to replace grazed tillers midway through the growing season, and thus regain health and vigor. Although restoration of vegetation communities consistent with the reference site described in ecological site descriptions is limited to a process that may take multiple decades if not centuries, recovery would be initiated through the passive action of removing livestock grazing impacts. The degree to which state-and-transition models apply and transitions have been passed will limit opportunity for recovery toward the reference site described in the absence of active vegetation manipulation. The introduction of non-native and invasive species, fire suppression activities, and sources of disturbance other than livestock grazing and physical impacts from livestock which did not define the reference site would continue, preventing full recovery even in the long term (decades, if not centuries).

Juniper

The no-grazing alternative would contribute little to control of juniper encroachment or additional risk of juniper dominance. Establishment of the majority of trees that dominate within closed canopy juniper communities was between 1890 and 1920 (Oregon State University Agricultural Experiment Station, 2005). The elimination of livestock grazing would allow retention of additional fine fuel as compared to any of the other alternative that include grazing authorization, allowing the spread of fire more closely resembling natural conditions outside the stands of closed canopy juniper. Areas dominated by juniper would continue to have the production of fine fuels limited by competition with the trees. Although seedlings and young juniper may be more likely to be eliminated by natural fire due to additional fine fuels, reduction of larger trees would be dependent on more extreme fire behavior.

Weeds

The no-grazing alternative eliminates the risk of introducing noxious weeds and invasive species to public lands resulting from soils disturbance by livestock activity and the increased spread of existing incursions resulting from seed distribution in fur, on hooves, and in livestock digestive system. A number of other vectors for seed dispersal and soil disturbance would continue to provide need for weed control programs coordinated by and with multiple entities.

Conclusion

The Idaho Rangeland Health Standard for native plant communities would continue to be met with implementation of the no-grazing alternative. Progress toward a full complement of native perennial species more consistent with ecological site potential would result in the long-term, equal to or greater than the 10-year term that livestock grazing would be eliminated pending additional evaluation. Recovery of ecological site potential vegetation communities would not occur within the 10-year period of initial livestock exclusion because recovery of all vegetation functional-structural groups from the existing ecological condition in sagebrush steppe type occurs at a slower rate, at least requiring decades if not centuries. Implementation of the no-grazing alternative would allow progress toward meeting the ORMP vegetation management objective. The elimination of stressors to biotic function induced by livestock management practices would allow recovery limited by stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would be provided.

3.6.1.3 Cumulative Effects

Cumulative impacts analysis area

The cumulative impacts analysis area (CIAA) for vegetation was set to the Swisher Springs and Swisher FFR allotment boundaries (MAP CMLV-1). BLM selected this CIAA because the direct and indirect effects of the alternative Swisher Springs and Swisher FFR grazing schemes will not extend to vegetation beyond the allotment boundaries. In other words, vegetation outside of the allotment will not be meaningfully or materially impacted by the grazing management considered within the allotment. It is further worth noting that plants rooted in the soil are not transient over long distances, with the small exception of the potential for wind to distribute seeds.

Past, present, and reasonably foreseeable future actions

The temporal frame for cumulative impacts to vegetation resources is defined by the continued presence of the effects of past actions and the anticipated longevity of reasonably foreseeable future actions. Past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts analysis were calculated using BLM GIS data and are presented in Table VEGE-15. The data used represent the best available information and the calculations based on the data are approximate.

Table VEGE-15: Past, present, and foreseeable actions within the Castlehead-Lambert allotment CIAA for vegetation

Type of Activity	Past and Present	Reasonably foreseeable additions
Rangeland water developments: Reservoirs Developed springs	 3 2	 0 0
Wildfire	2000 – Meadow 2007 - Crutcher Crossing 2,369 acres (1985-2012)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	152 acres rehabilitation	
Noxious Weed Presence	1 documented infestations	Fewer than 0.05acres/year new weed infestation anticipated
Roads	9 miles unsurfaced routes 0 miles surfaced roads	None

Rangeland projects have been constructed in the Swisher Springs and Swisher FFR allotments to meet a number of objectives, many to facilitate livestock management. Livestock management projects that may have a long-term residual effect on vegetation include reservoir construction and spring development, projects designed to provide livestock water. The residual effects of surface disturbance from construction or extensive maintenance of each is limited to no more than a decade, while indirect impacts to vegetation resulting from livestock concentration at watering sources are renewed annually. Adjacent to each water source, livestock concentration reduces and removes native perennial grass, forb and shrub species. With a radius of less than 1/8-mile of impact to vegetation resources around each water development, the five water developments identified in Table VEG-15 would result in 157 acres of public land that are annually impacted by livestock concentration adjacent to developed water and would not improve toward reference site conditions with continued livestock grazing authorization.

Although allotment division and pasture division fence construction to date originally altered vegetation resources, residual impacts to vegetation from construction have diminished since construction. Annual livestock trailing adjacent to some sections of fence continue localized, but unquantified impacts to vegetation resources.

Wildfire is a natural disturbance factor that is recognized in the natural variability of described reference site conditions for sagebrush/bunchgrass ecological sites. The largest impact from wildfire to native sagebrush-steppe vegetation communities is the short-term removal or reduction in the presence of sagebrush. Paysen and others (USDA USFS, 2000) identified an interval of 30 years or more for sagebrush recovery after fire under pre-1900 succession. Altered fire return intervals with changes to human ignited fires, suppression actions, and the introduction of annual species have resulted since settlement. Vegetation change in the Swisher Springs and Swisher FFR allotments that have resulted from the two fires documented since 1985, totaling 2,369 acres (some areas have burned more than once during this period) (Map FIRE-3), has resulted in the natural variability of the reference site. The location and acreage where indirect impacts have led to declining plant community health and condition due to altered fire return intervals, combined short-term impacts from livestock grazing following wildfire (less than 5 years), and the dominance of annual species cannot be quantified. As a result, the cumulative impacts of wildfire on the vegetation conditions in the CIAA is both beneficial, leading toward conditions within the natural variability of the reference site, and indirectly adverse, leading toward residual impacts that often times have resulted in declining plant and vegetation community health and vigor.

Records of past vegetation treatments that have residual impacts to vegetation resources are limited rehabilitation action of 152 acres, resulting in the improvement of native perennial plant health and vigor within the project area.

Actions to control the introduction and expansion of noxious weeds within the CIAA are ongoing, as noted in the Affected Environment section (Section 3.3.1.1). Treatments are limited in size and result in the improved health and vigor of native perennial vegetation communities.

Nine miles of unsurfaced routes within the CIAA, with an average 8-foot width of ongoing surface disturbance from vehicular traffic, results in 9 acres where vegetation resources are held in poor condition.

In combination, past, present and reasonably foreseeable future actions that have led toward improving vegetation health and conditions include wildfire consistent with the natural fire return interval, rehabilitation actions on 152 acres, and ongoing control of noxious weeds on approximately 0.05 acres annually. Actions that have led toward declining vegetation health and vigor include the indirect effects to approximately 157 acres of concentrated livestock activity adjacent to water development projects, wildfire at intervals inconsistent with natural return intervals, the combined impacts to vegetation from wildfire and livestock grazing immediately following fire, and the ongoing disturbance to approximately 9 acres of unsurfaced vehicular routes. The residual effects of livestock management practices through the last few decades of the 1800s and the first few decades of the 1900s, as moderated through the remainder of the 1900s, define sagebrush steppe vegetation communities lacking the full expression of co-dominance by sagebrush species and deep rooted native perennial bunchgrass species (see Table VEGE-

13). Past, present and reasonably foreseeable future actions identified above and influencing localized vegetation conditions are secondary to the direct and indirect influences of historic grazing practices on current vegetation conditions. As a result, the ORMP vegetation management objective to improve unsatisfactory and maintain satisfactory vegetation health/condition defines the cumulative effects threshold to limit downward trend away from the native perennial vegetation composition defined in the reference site of ecological site descriptions.

3.6.1.3.1 Alternative 1 Effects

Under Alternative 1, progress toward a full complement of native perennial species consistent with ecological site potential would not result in the Swisher Springs allotment. The native vegetation condition of pastures 1 and 3, grazed in alternate years during the active growing season, would not improve, which would lead to the majority of the allotment remaining in early to mid-ecological condition. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, downward trend in the vegetation condition within the Swisher Springs allotment would not meet ORMP vegetation management objectives. The threshold for unacceptable change in vegetation condition would be exceeded.

3.6.1.3.2 Alternative 2 Effects

Under Alternative 2, livestock management practices in the Swisher Springs allotment would lead to static or additional downward trend in condition of native vegetation communities. Progress toward a full complement of native perennial species consistent with ecological site potential would not result. The native vegetation condition of pastures 1 and 3, grazed in alternate years during the active growing season, would not improve, which would lead to the majority of the allotment remaining in early to mid-ecological condition. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, downward trend in the vegetation condition and health within the Swisher Springs allotment would not meet ORMP vegetation management objectives or the Idaho Standard 4 for Rangeland Health – Native Plant Communities. The threshold for unacceptable change in vegetation condition would be exceeded.

3.6.1.3.3 Alternative 3 Effects

Under Alternative 3, the condition of pastures 1 and 3 in the Swisher Springs allotment, with limitations to utilization during the active growing season, would improve and lead to improving ecological status and rangeland health. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Swisher Springs allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for rangeland health-native plant communities. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.6.1.3.4 Alternative 4 Effects

The season-based alternative, with its implementation of seasonal constraints on periods of grazing use to meet resource objectives and with its reduction in livestock grazing use would result in improved native perennial plant health and vigor in the Swisher Springs allotment. Progress toward a full complement of native perennial species consistent with the reference site described in ecological site descriptions would result over the 10-year term of the permit. Standard 4 would be met. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Swisher Springs allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for

Rangeland Health – Native Plant Communities. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.6.1.3.5 Alternative 5 Effects

Under the no-grazing alternative, the Idaho Rangeland Health Standard for native plant communities would continue to be met. Progress toward a full complement of native perennial species more consistent with ecological site potential would result in the long-term, equal to or greater than the 10-year term that livestock grazing would be eliminated pending additional evaluation. When these consequences are combined with the past, present, and reasonably foreseeable future actions that have impacted vegetation resources within the CIAA, upward trend in the vegetation condition and health within the Swisher Springs allotment would meet ORMP vegetation management objectives and the Idaho Standard 4 for Rangeland Health – Native Plant Communities. Progress would be attained toward improving vegetation condition below the threshold of unacceptable change.

3.6.2 Soils

3.6.2.1 Affected Environment

Geology, Parent Material, and Soils

Located within the Upper Owyhee sub-basin just east of Castlehead-Lambert are the Swisher Springs and Swisher FFR allotments. Elevation ranges from 4,920 feet near Castle Creek to about 5,700 feet above Swisher Spring. The terrain is gentle to moderately steep (0 to 30 percent) in the Swisher Springs allotment and consists primarily of east-facing side slopes, foothills, benches, and fan terraces. Bottomlands and lower elevations, also the location of the Swisher FFR, are mostly of sedimentary rock and basalt origin, while upper elevations are composed of welded rhyolite.

There are six different soil map units within the Swisher Springs and Swisher FFR allotments representing a wide variety of inherent characteristics that influence vegetative growth, erosion potential, site productivity, drainage class, available water supply, and more. Soils within the analysis area have been mapped and are described in the Owyhee County Soil Survey (USDA NRCS, 2003b) that delineates soil map units, landforms, vegetation components, and provides interpretive information on soil use and management. These soils are tied to ecological sites (Map ECOL-3), which are developed based on environmental factors such as vegetation, soils, and hydrology (Appendix M – Soils and Rangeland Vegetation).

Soil and hydrologic function are critical parameters for properly functioning upland areas. The Swisher Springs and Swisher FFR allotment soils are shallow to moderately deep (with deeper inclusions) and generally have a xeric (arid) moisture regime and a frigid (very cold) soil temperature regime (USDA NRCS, 2003b). Soils are well-drained but can have very slow infiltration rates when thoroughly wet, especially if they contain a high clay content and shrink-swell potential.

Dominant soil texture classes in the Swisher Springs allotment are stony loams, silt loams, and a small amount of very gravelly coarse sandy loam. Swisher FFR contains primarily silt loam and cobbly loam, but other soil surface textures, such as very stony silt loam and stony loam, exist within the allotment area. Clay content is highest (31 percent to 36 percent) near the foot slopes and along water sources, moderate (26 percent to 31 percent) around the gentle valley slopes, and low (22 percent to 27 percent) to very low (less than 22 percent) along the higher elevation mountain side lopes and ridges.

The majority of ecological sites at lower elevations are associated with the Shallow Claypan 12-16” and are typically loamy to clayey with high amounts of coarse fragments on the surface and in the profile

(Map ECOL-3). The Loamy 13-16" ecological site is situated along mountainside slopes, while one small area at the western boundary of pasture 2 in the Swisher Springs allotment represents Very Shallow Stony Loam 10-14".

Based on inherent soil characteristics, the erosion hazard from water in the Swisher Springs allotment and Swisher FFR allotments is rated slight (70 and 75 percent), with the exception of steeper (less than 30 percent) side slopes where erosion hazard is rated moderate (25 to 30 percent). In general, soils within the allotment area are stable with little to no erosion, especially where surface rock fragments provide cover and greatly modify runoff potential and sediment movement. Slopes range from 0 to 30 percent across the allotment but may exceed 30 percent in some localized areas within drainages. The wind erosion hazard is rated low.

Existing Condition

Existing conditions in the Swisher Springs and Swisher FFR allotments are a reflection of past management activities and natural processes. Assessments of rangeland health completed in the January 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012c) reveals that the soil and hydrologic function integrity indicators fall in the slight-to-moderate category from reference conditions. Standard 1 for Watershed is being met (Table SOIL-11); however, the currently still-limited juniper encroachment is identified as a future concern for watershed health in the absence of fire. Despite a slight-to-moderate rating, presence of localized impacts, and some juniper encroachment, soil and hydrologic integrity and their associated attributes are maintained.

Table SOIL-11: Summary of ratings for soil stability and hydrologic function

Allotment & Pasture (#)		**Meeting Standard 1 - Watershed**	
	Departure Rating	**Yes**	**No**
Swisher FFR	**slight-to-moderate**	**X**	
Upper & Lower	slight-to-moderate	x	
Swisher Springs	**slight-to-moderate**	**X**	
Road Field (1)	slight-to-moderate	x	
Mountain Field (2)	none-to-slight	x	
Lower Allotment (3)	slight-to-moderate	x	

Erosion indicators, such as water flow paths, soil loss, and pedestals, were mostly historic in nature and armored with gravel, litter, and organic matter. A lack of biological crusts was noted and reflects a potential increase in soil degradation where rocks and gravels are not present, especially in fine-textured soils. Observations still support a generally stable watershed that, despite reduced perennial plant vigor, contains good seed heads and some recruitment of new plants.

Ground cover data (Table SOIL-12) collected from long-term trend sites serves as an additional important indicator for soil site stability and Standard 1. The data indicate a significant long-term decrease in perennial basal cover, while bare ground decreased short-term but increased over the long-term. This suggests that there has not been a substantial improvement in herbaceous vegetative cover. More durable soil cover, such as gravels, persistent litter, and biological soil crusts, showed a significant decrease. The steadiest increase is represented by non-persistent litter, while total vegetation showed variable results.

Table SOIL-12: Summary of ground cover results from trend data (1988 to 2009) in three plots of the Swisher Springs allotment

Component	Ground Cover – Trend Summary
Bare Ground	Mostly a significant short-term decrease, long-term increase
Basal Cover	Significant long- and short term decrease
Non-persistent Litter	Mostly a significant long- and short-term increase
Total Vegetation*	Mostly a non-significant short-term increase or static, mixed long-term
Canopy Cover*	Mostly a significant long- and short-term increase
Rock/Gravel/Persistent Litter/Biotic Crust	Mostly a decrease, significantly over the long-term

*Trend data from 1998 to 2009

Vegetation has been influenced by two recent fires that burned portions of the Swisher Springs allotment but did not reach Swisher FFR (Map FIRE-1). In 2000, the Meadow fire burned approximately 1,800 acres within the allotment. In 2007, the Crutcher fire affected approximately 1,060 acres and re-burned areas along the western boundary, extending slightly past the previous perimeter of the 2000 Meadow fire. No rest occurred after the 2007 Crutcher fire. Pastures 2 and 3 have been impacted the most, with 95 percent and 94 percent (respectively) of their areas burned, while 49 percent of pasture 3 was affected.

Where upland vegetation was burned, juniper and shrubs were removed or reduced, which provided annuals and perennials an opportunity to re-establish. Static conditions or slight improvements in upland vegetation cover are apparent and are likely related to resting the allotment in 2001 and 2002 after the fire. However, the allotment was not rested after the 2007 Crutcher fire, although fences within the pastures apparently provided some exclusion around the burn perimeter within the center of the allotment.

The plant community shows an increase in Sandberg bluegrass and some decrease in bluebunch wheatgrass that, from a cover perspective for soils, show satisfactory recovery after the fire. Bare ground, however, has only decreased over the short term and otherwise shows an increase in all pastures over the long term. Though this increase in bare ground over 2 decades is not significant at two out of three sites, it is not desirable, especially in areas where juniper is present. Recent livestock grazing has had little influence on juniper encroachment, other than the removal of fine fuels that support the spread of wildfire. Even in the absence of livestock grazing, closed canopy stands produce limited shrub and herbaceous biomass. Where juniper is still encroaching, the decreased plant biomass, insufficient residual litter amounts and persistent soil cover, decreased root structure diversity, increased erosion potential, and an altered hydrologic and nutrient cycle over the long term (more than 20 years) persists. However, the hydrologic and nutrient cycle currently continues to function due to a mosaic pattern, rather than connected dense stands of mature trees.

After the 2002 Meadow fire and 2007 Crutcher fire removed juniper in some of pasture 1 and most of pastures 2 and 3, recovery of herbaceous plant and litter cover in the burned areas has provided soil stability and hydrologic function throughout the post-fire years. This has been aided by the inherently high surface gravel and rock content indicative of this allotment as well as a 2-year rest period immediately following the Meadow fire.

The western portion of pasture 2 is most vulnerable to juniper encroachment, as it contains areas not affected by the recent fires. The juniper discussion in Appendix M - Soils addresses concerns associated with the spread of juniper. Over the longer term, the imbalance in vegetative composition associated with juniper in comparison to ecological potential is the primary concern for watershed health for the Swisher Springs and Swisher FFR allotments. Improvements to plant communities, therefore, remain static or at a downward trend, regardless of whether livestock grazing occurs. Juniper is therefore not further discussed in the effects analysis for the alternatives since no vegetation treatments are proposed.

Few roads are present in the Swisher Springs and Swisher FFR allotments and provide access to the pastures. However, road conditions are variable and often deteriorate with distance from the Owyhee Scenic Byway (Mud Flats Road), which is located north of the allotment. Soil disturbance from recreation is generally limited to vehicular use and restricted to existing roads and trails and has not been an issue.

3.6.2.2 Direct and Indirect Effects

Analyses of Alternative 1 and the action Alternatives 2 through 5 are based on consequences of seasons and intensities of livestock grazing use provided in Appendix M - Soils and the Soils Affected Environment section for the Swisher Springs and Swisher FFR allotments above. These sections provide ecological, physical, and biological concepts for expected soil impacts resulting from livestock management practices.

A detailed discussion on rangeland vegetation inventory and ecology and the state-and-transition model, which are tightly connected to upland soils, can be found in Appendix M – Rangeland Vegetation. More site-specific information for the Swisher Springs and Swisher FFR allotments is also available in the Rangeland Vegetation Section 3.6.1. Further discussion of processes involving upland soils and sediments and their effects on water resources, riparian areas and wetlands can be found in Water Resources Section 3.6.4.

3.6.2.2.1 Alternative 1 Impacts

Alternative 1 would continue to authorize grazing under the same terms and conditions as in the past, though with reduced AUMs (based on recent maximum active use) compared to the current permit (see Section 2.8.3 and Appendix D – Tables 5 and 6). The livestock grazing recent maximum use that has occurred under Alternative 1 serves as the baseline for comparison to the other alternatives.

Under Alternative 1, grazing would occur during the spring and early summer season when impacts from hoof action on wet or saturated soils are at their greatest potential to result in soil pugging (plunging hoofs into wet soil creating a void) and compaction, although range readiness criteria would be applied. Medium- to heavy-textured soils, typically clay, are especially prone to damage during the spring grazing season because they tend to have high moisture-holding capacity, are usually at or near field capacity, or have higher water content due to snow melt. The lower elevations of pastures 1 and 3 with shallow claypan soils are the most susceptible.

Grazing during the dry summer season would occur in pasture 2 and concentrate livestock in riparian areas and their associated nearby uplands. Disproportional congregation of livestock with summer use could promote the potential of impacts to protective ground cover, resulting in compromised soil stability and hydrologic function in localized areas compared to remaining portions of the pastures. However, yearly deferment in pasture 2 would permit grazing from mid- to late summer and allow vegetation to maintain vigor and reproduction that would benefit soil stability and hydrologic function.

Grazing in all other pastures would occur during the critical growing season (May 1 to July 1) in the spring and early summer and does not improve vegetation vigor, especially native perennial bunchgrass reproduction and cover, therefore increasing the overall potential for sediment movement and adverse effects to watershed health (Appendix M - Soils). These effects would be amplified if flexibility to any of the pastures is given, as it has been in the past (Appendix B), especially if additional growing season use occurs under the prolonged absence of rest or deferment years. However, spring and early summer season use would improve distribution throughout the pastures due to increased water availability and palatable forage on the uplands, thereby reducing soil impacts because of dispersed grazing patterns.

With livestock use during the active growing season, improvements to plant communities would be minimal or decline, since rest in less than the planned 1-of-2-years cycle, as it has occurred in actual use records, may not provide adequate opportunity for recovery of plant health and vigor following repeat years of active growing season use. The ability of desirable perennial bunchgrass species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-desirable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be reduced.

The continued decline in deep-rooted bunchgrasses would likely increase bare ground and would therefore promote increased water flow patterns as patches become larger and connected. The resulting accelerated erosion and movement of sediments leads to surface loss and degradation, changes in infiltration patterns, and loss of persistent litter. This makes it increasingly more difficult for herbaceous cover to regenerate and maintain, so that nutrient cycling, soil stability, and hydrologic function are further altered over the long term (Appendix M - Soils).

Plants grazed during the critical growing season for native perennial bunchgrasses would experience decreasing soil moisture that does not provide opportunity for regrowth before the dormant period. Pastures 1 and 3 are most affected because of a reduction in seed availability that influences reproduction of deep-rooted native bunchgrass communities with repeated years of active growing season grazing. This would promote an increased potential for sediment movement and alter the hydrologic and nutrient cycle over the short and long term. Custodial authorization of grazing in the Swisher FFR allotment would not include the defined seasons of use. Public land is limited within the allotment, with portions located away from areas of livestock concentration, which would lead to lighter grazing use and reduced impacts to upland soil and hydrologic function as compared to the private land portions of the allotment.

Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel would provide sites for establishment of weeds and invasive species. Indirect impacts from weeds on soils are primarily associated with changes in soil moisture availability, nutrient cycling, and a decrease in soil stability due to reduced root systems. The latter is especially a concern during the dry season and after fire. Livestock is expected to contribute to the distribution of weeds and invasive species though the 2012 Rangeland Health Assessment (USDI BLM, 2012c) and Determination (Appendix J) did not identify them as dominant.

Implementation of Alternative 1 would continue to have similar effects on the existing condition described for soils in upland watersheds. Since grazing would occur during the critical growing season with limited rest and/or deferment, and flexibility would be built into the permit to allow for fluctuation in actual use (Appendix B), Alternative 1 would provide little to no improvement to ecological function and site potential because proper nutrient cycling, hydrologic cycling, and energy flow would not be maintained or improved. Progress toward enhancing soil and upland watershed resource issues and associated impacts consistent with ecological site potential are not expected to result or allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

Continued management of the Swisher FFR allotment in the custodial category, with the flexible seasons of use and livestock numbers grazing in association with the private land in the allotment, would not contribute to failure to meet the Rangeland Health Standard for upland watersheds and ORMP soil objectives. If information attained in the future identifies unacceptable impacts to public land vegetation resources, the need to change the management category from custodial would be addressed.

3.6.2.2.2 Alternative 2 Impacts

The main difference between Alternative 2 and Alternative 1 would authorize grazing with livestock numbers and grazing schedule equal to those identified in the current permit (see Section 2.8.3 and Appendix D - Tables 5 and 6). Aside from an increase in active AUMs by 7 percent, season of use is identical to Alternative 1.

While the added number of cattle is small, it could result in periodic utilization levels that would exceed recommended conservative stocking rates. When combined with use during the critical growing season, increased utilization could negatively affect vegetation vigor, reproduction, and cover, thus elevating the potential for adverse impacts to soil and watershed health as discussed under Alternative 1.

Although range readiness criteria is applied, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would increase with elevated stocking rates and primarily affect pastures 1 and 3. Increased livestock numbers are also expected to contribute to the spread of invasive annuals and exotic weeds, as discussed under Alternative 1, although effects may be too small to be measurable. However, under Alternative 2, the concentration of soil disturbance can be deemed higher and increases the risk for weed infestation and adverse impacts on soil stability and nutrient cycling because of an increase in stocking rates.

The implementation of Alternative 2 would have similar or increased negative effects as those described for Alternative 1 on upland soil condition and watershed health. Although the grazing schedule in Alternative 2 proposes rest, the frequency of deferment is less than recommended conservative stocking rates. Active use AUMs would be increased by 7 percent and riparian grazing would put pressure on adjacent uplands during the height of the summer. Progress toward improved soil and upland watershed resource issues and associated impacts consistent with ecological site potential would not result or allow in an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

Grazing authorization in the Swisher FFR allotment with implementation of the applicant's proposed action for Alternative 2 would be the same as identified in Alternative 1 – see the analysis of the consequences of these actions in the Alternative 1 section above.

3.6.2.2.3 Alternative 3 Impacts

Alternative 3 would improve existing condition when compared to Alternative 1 and Alternative 2, in part by implementing performance-based terms (Section 2.3) and conditions related to upland utilization (see Section 2.8.3 and Appendix D - Tables 5 and 6). Although active use AUMs would increase by 7 percent under this alternative (as well as Alternative 2), this would not undermine deep-rooted perennial bunchgrass growth and vigor because their reproductive capability would be maintained by restricting utilization to slight (≤20 percent) levels during the growing season. Maintenance and recovery of bunchgrass communities would promote soil stability and watershed function and provide soil cover, decrease bare ground, and generally reduce the susceptibility of the area to accelerated erosion. Deep-rooted vegetation would increase infiltration, provide litter, and aid hydrologic function and nutrient cycling.

Since functioning upland soil and watershed processes for each ecological site are intimately tied to healthy plant communities, maintenance of native vegetation and cover is of primary interest. Additional performance-based terms and conditions for vegetative stubble height within sagebrush and perennial grassland for sage-grouse upland and riparian lentic areas would therefore also be beneficial for improving and maintaining soil stability and hydrologic function.

Although range readiness criteria would be applied under Alternative 3, physical soil impacts, such as compaction and mechanical hoof shearing during the wetter spring and early summer, would slightly increase with elevated stocking rates. While an increase in active use AUMs by 7 percent may not be readily detectable, the concentration of soil disturbance can be deemed higher for Alternative 3, compared to Alternative 1, and increases the risk for weed infestation and adverse impacts on soil stability, moisture retention, and nutrient cycling.

The implementation of Alternative 3 is expected to improve soil and upland watershed health over Alternative 1. Despite an increase of active AUMs by 7 percent and limited rest and/or deferment, the 20 percent upland utilization limit during the growing season, along with additional terms and conditions for riparian and wildlife resources, are in place to improve vegetation. This would reduce grazing pressure on native bunchgrasses and provide improvement to ecological function and site potential. As a result, soil stability, productivity, hydrologic function, nutrient cycling, and energy flow and would be positively affected over the short and long term and would allow for an upward trend over the life of the permit.

Grazing authorization in the Swisher FFR allotment with implementation of Alternative 3 would be the same as identified in Alternative 1 – see the analysis of the consequences of these actions in the Alternative 1 section above.

3.6.2.2.4 Alternative 4 Impacts

The main difference between Alternative 4 and the other grazing alternatives is that in Alternative 4, there is more rest during the growing season and seasonal restrictions, which result in a reduction in cattle numbers and an overall allotment-wide decrease in active use AUMs by 34 percent compared to Alternative 1 (see Section 2.8.3 and Appendix D – Tables 5 and 6).

The implementation of increased periodic rest and deferment outside of critical growing season use in only 2 of 3 consecutive years (see Section 2.8.3 and Appendix D – Tables 5 and 6) is expected to increase or maintain vegetative vigor of native perennial bunchgrasses. This would positively affect soils because improved upland vegetation communities would provide added soil stability and hydrologic function. Since deferment during the active critical growing season is used in 2 out of 3 years, vegetative vigor of native perennial bunchgrasses would be maintained or increased and would provide for an increased opportunity to positively impact soil and watershed health. In pastures 1 and 3, grazing in riparian areas during the height of the summer would be avoided and benefit soils by reducing livestock congregation along nearby uplands that could promote sediment movement into streams from concentrated use.

The restricted seasons and the resulting decrease in active use AUMs by 34 percent, compared to Alternative 1, would reduce utilization levels. This would provide upland vegetation communities with an opportunity to improve and would result in increased soil cover, decreased bare ground, and reduced susceptibility of the area to accelerated erosion. The overall allotment-wide reduction in cattle numbers would benefit soil and watershed health by decreasing grazing pressure on plant communities and would promote soil stability, litter, and nutrients. Although range readiness criteria would be applied, spring grazing once every 3 years in all pastures would increase the potential of impacts from hoof action on wet or saturated soils during that year, as described under Alternative 1.

While the risk of spreading noxious weeds and invasive species remains, the concentration of soil disturbance and adverse impacts on soil stability and nutrient cycling is expected to be lower for Alternative 4 because of decreased active use AUMs by 30 percent.

Alternative 4 would make significant progress toward desired conditions because the incorporation of rest and deferment from the critical growth period, along with reduced livestock numbers, would promote an increase in upland plant growth, vigor, and cover compared to Alternative 1. Although no rest is used in pastures 1 and 3 and the number of days in each pasture during most of the rotation years are close to or greater than in Alternative 1, the reduction of maximum actual use by 34 percent would minimize the stocking rate/critical growth period use effects, improve upland vegetation communities, and result in decreased adverse impacts to soils.

The implementation of the season-based Alternative 4 is expected to maintain or improve soil and upland watershed health over Alternative 1. With conservative or no grazing occurring during the critical growing season, Alternative 4 allows for proper nutrient cycling, hydrologic cycling, and energy flow and provides an opportunity to enhance ecological function and site potential. Improvement in soil and upland watershed resource issues and associated impacts consistent with ecological site potential would allow for an upward trend over the life of the permit to positively affect soil stability, productivity, and hydrologic function over the short and long term.

Grazing authorization in the Swisher FFR allotment with implementation of Alternative 4 would be the same as identified in Alternative 1 – see the analysis of the consequences of these actions in the Alternative 1 section above.

3.6.2.2.5 Alternative 5 Impacts

Alternative 5 would eliminate all grazing in the Swisher Springs allotment for 10 years and would thus make the most significant progress toward desired conditions because soil impacts would decline and would only be affected by recreational grazing (i.e. from equestrian use), wildlife, and juniper encroachment. This alternative would provide for the most unimpeded and rapid improvement of soils affected by livestock grazing, but would not eliminate soil impacts resulting from other uses.

Sites that are currently impacted from grazing would move toward desired conditions of improved soil quality, increased water infiltration, and vegetative cover. Site productivity would increase and mechanical damage to the soil surface from livestock hoof action would cease. Extended rest from livestock grazing would enhance perennial plant vigor and production, along with subsequent reproduction and establishment. The increased canopy cover, surface litter, above-ground structural material, and fibrous root matter would aid in protecting the soil from both wind and water erosion. However, increased surface fuels may elevate the potential for higher soil burn severities in the event of a fire.

Soil conditions have the potential to improve over time although recovery would depend on soil and site characteristics and climate and may not be evident in all locations. Natural processes of recovery would be achieved through cycles of wetting and drying, shrinking and swelling, freeze and thaw, root growth, and bioturbation of compacted layers, and provide additional soil organic matter. Increases in residual vegetation, energy flow and nutrient cycling, ground cover, and soil stability would improve over the long term. Eliminating livestock disturbance would reduce the risk of weed infestation and its associated adverse impacts on soil stability and nutrient cycling, although other vectors for seed dispersal remain and would continue the need for weed control programs coordinated by multiple entities.

The implementation of Alternative 5 is expected to maintain or improve soil and upland watershed health over the existing condition. The allotment would make significant progress toward meeting Rangeland Health Standard 1 and ORMP objectives because proper nutrient cycling, hydrologic cycling, energy flow, and soil and hydrologic function would be maintained or allow for an upward trend over the life of the permit and positively affect soil stability, productivity, and hydrologic function over the short and long term.

3.6.2.3 Cumulative Effects

Analysis Area and Temporal Timeframe

Soil and watershed standards and objectives are applied to activity areas, which are the individual pastures within the allotment. The allotment is considered an appropriate geographic unit for assessing direct and indirect soil environmental effects because soil productivity is a site-specific attribute of the land and is not dependent on the productivity of an adjacent area. Similarly, if one acre of land receives incremental soil impacts – i.e., reduced soil porosity, water holding capacity, aeration, long-term productivity etc. – and a second management activity is planned for that same site, then soil cumulative effects are possible.

The cumulative impacts analysis area (CIAA) for upland soils was set to the boundary of the Swisher Springs and Swisher FFR allotments. The CIAAs were selected because the direct and indirect effects of grazing management on upland soils, as well as hydrologic function and energy flow, can be detected within the allotment boundary. Outside of this area, however, direct and indirect effects of the grazing scheme will be so small as to not create identifiable cumulative effects. At greater distances from the allotment, it becomes even more difficult to determine any impacts due the dilution effect that comes with the increased acreage.

Through erosional and depositional processes, upland soils do, however, provide for the sediment sources that enter riparian areas and are transported within stream systems throughout the watershed and beyond. While the watershed level could be considered to serve as the CIAA for upland soils, soil and hydrologic function is site-specific. To the extent that soil movement in stream channels affects resources outside of the allotment, the direct/indirect effects and cumulative effects are considered in detail in the Water Resources Section 3.6.4.

While it is possible that cumulative impacts from sediment movement pass beyond a fence line onto a neighboring allotment or area, the primary consequence would be its impacts on streams and water quality, which, again, is covered by Water Resources. Since wind erosion hazard is rated low for the allotment and beyond (USDA NRCS, 2003b), it did not trigger the need to expand the analysis area beyond the allotment boundary. Similarly, mass failures are also a non-issue, especially since the proposed actions do not include any road construction, juniper treatment, or prescribed burns.

Based on available research and current technology, the Idaho Standards for Rangeland Health (Appendix A), ground cover trend (USDI BLM, 2012c), and the ORMP (USDI BLM, 1999a) were used as a basis for setting thresholds for measurable or observable soil properties or conditions. The threshold values, along with areal extent limits, serve as an early warning signal of reduced soil and hydrologic function. Significant changes in soil productivity of the land are indicated by changes in soil properties that are expected to result in a reduced productive capacity over the planning horizon. Likewise, declining conditions for rangeland vegetation consistent with ecological site potential contribute to deteriorating soil and hydrologic function. Vegetation therefore becomes the primary indicator that determines upland watershed health. Additionally, influences on soils from humans, general grazing, season of use and stocking rates are discussed in greater detail in Appendix M - Soils. The intent is to provide an overview of commonly observed impacts, trends, and potential consequences associated with range management. These impacts are relevant to all alternatives and provide the background for the comparison of effects.

Analysis timeframes for cumulative effects include past and present activities that have created the present conditions, and reasonably foreseeable future activities planned within the next 3 years, including the expected duration of effects from current and future activities. Reasonably foreseeable actions include activities with completed NEPA, scoping, or decisions, and with implementation planned within three years. For this evaluation, short-term effects are those that occur approximately within the first 10 years following permit renewal, long-term effects are those that expand 10 years or beyond.

Existing Conditions

As noted above, the CIAAs for soils in the Swisher Springs and Swisher FFR allotments are their respective allotment boundaries. This area includes portions of the Deep Creek watershed and encompasses a total of 3,851 acres for Swisher Springs. Based on inherent soil characteristics, the erosion hazard from water is rated slight (70 percent) to moderate (30 percent). The Swisher FFR allotment includes a total of 762 acres, and the erosion hazard from water is rated as slight (75 percent) to moderate (25 percent). No ratings are severe.

Past, present, and reasonably foreseeable future activities within the analysis area relevant to cumulative effects were calculated using approximated BLM GIS data and are displayed in Table SOIL-13. The soils and upland watershed cumulative effects analysis areas coincide with the direct and indirect analysis areas for which existing conditions are described in Section 3.6.2.1.

Table SOIL-13: Past, present, and foreseeable actions within the Swisher Springs and Swisher FFR allotments cumulative effects analysis area

Type of Activity	Past and Present	Reasonably Foreseeable Future
Grazing AUMs	Maximum 319 AUMs (Swisher Springs in 2006)* Maximum 127 (Swisher FFR in 1997)*	Permit to be processed by 2013
Wildfire	2,853 acres (between 2000-2007)**	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	152 acres (1984)[#]	None
Noxious Weed Presence	1 recorded infestation	Fewer than 10 acres/year of treatment anticipated
Roads	7 miles (Swisher Springs) 2 miles (Swisher FFR)	None

Past records extend to *1986; **1960; [#]earliest record

Over the past decades, livestock grazing has been the dominant land use activity in the area. Wildfires have caused localized disturbances while wildlife grazing, prescribed fire management, juniper woodcutting, and recreation have had limited effects due to their localized and small areal extent.

An additional influence on the watersheds has been current and past fire and fire suppression activities. As a result, the CIAAs have been altered from what would be expected under a natural disturbance regime, mainly due to an increase in juniper (see Rangeland Vegetation Section 3.6.1 and Appendix M). The allotment has been primarily grazed throughout the spring and summer, and a variety of range improvement projects, such as spring developments, fences, cattle guards, and troughs have been implemented across the landscape to aid in livestock grazing management.

The movement of upland sediment across the landscape is initiated in the form of erosion and, over time, reaches a water source that allows for further transport. Erosion rate, amount, and magnitude are dependent on slope, topography, climatic events, parent material, soil characteristics, vegetation, and potential localized impacts. As previously mentioned, the majority of erosion potential within each of the CIAAs is slight. The greatest cumulative effects occur where uplands encounter non-functioning degraded riparian areas, especially perennial streams that are not meeting water quality standards (Water Resources Section 3.6.4).

However, grazing management on BLM-administered lands periodically change in order to meet Rangeland Health Standards, which have been in place since 1997 to assess grazing activities and their impacts on resources. These periodic management changes to meet standards eventually improve overall resource conditions in the watersheds or make significant progress toward meeting.

Past, Ongoing, and Reasonably Foreseeable Activities

Livestock Grazing: Less-restrictive grazing use during the turn of the century and into the early parts of the 20th century has resulted in historical resource impacts that span from physical soil impacts due to high livestock numbers to increased erosion from alterations in vegetation. Restrictions and management guidelines have been implemented over the past decades and have contributed to improved upland soil and vegetative conditions. Livestock grazing within the CIAA continues to be the dominant land use activity and occurs primarily throughout the spring and summer. The pressures from grazing have physical, biological, and chemical effects to soils (Appendix M – Soils) that vary based on differences in season of use, stocking rate, and length of use.

Wildfires and Fire Suppression: Wildfires have burned 2,853 acres (74 percent) in the in the Swisher Springs allotment CIAAs between 2000 and 2007 (Tables SOIL-13 and 14; Map FIRE-2). Consequent resource damage from mechanized suppression activities and burn severity have caused short-duration disturbances to soils that range from negligible to severe, depending on location, size, and severity of burn (Table SOIL-14). When wildfires have burned across upland soils, the compounding impacts from temporary loss of infiltration capacity, overland flow, and increased soil erosion have occurred in localized areas but generally decrease or vanish over a period of 1 to 6 years (DeBano, 1981) (Dyrness, 1976) (Huffman, MacDonald, & Stednick, 2001). The change in vegetation, however, can be long long-term.

Primary risks from fires in the foreseeable future are associated with upland erosion from steep slopes above drainages, as well as roads, especially at stream crossings (Water Resources Section 3.6.4). Loss of soil productivity could be extended, depending on burn severity, location, and post-fire climate characteristics, especially if invasive annuals establish and further alter the plant community. Following a severe fire, rehabilitation efforts to mitigate the fire's effects on erosion and sediment delivery could occur and reduce potential negative effects. Grazing may also be suspended for a minimum of 2 years to allow vegetation to recover and would reduce additional impacts to soils.

Long-term effects to soils from wildfire are most observable where juniper has been removed and deep-rooted native bunchgrasses have re-established. Past and current fire suppression, however, has influenced fire frequency that has contributed to the increase of juniper across the landscape. The continual incremental effects of juniper encroachment contribute to a cumulative increase in upland erosion over the long-term but can change with the probability of future wildfires.

Vegetation Treatments: Vegetation treatments, such as prescribed fires as well as sagebrush control, have had limited effects on the watersheds due to their localized and small extent (Tables SOIL-13 and 14). In the mid-1980s, 152 acres of prescribed fire were used to treat vegetation. Though no prescribed fires are scheduled for the reasonably foreseeable future, vegetation treatments at a later point are likely to continue and would have short-term localized impacts on upland soils but would benefit watershed health over the long term.

Weed Treatments: There is documentation for one exotic weed infestation covering in the analysis area (Tables SOIL-13 and 14). Disturbed soils, for example around salting areas or water developments, provide an optimal location for weed establishment and subsequent invasion and have the potential to increase localized erosion, deplete soil moisture, and alter nutrient levels. Fewer than 10 acres per year of the currently few and limited weed infestations are anticipated to be treated. Activities associated with the small areas impacted by weed treatments would have no effect on upland soils and watershed health.

Roads: The construction of roads on public lands has resulted in the removal of soils from the productive land base on approximately 9 miles of roads that traverse both CIAAs (Tables SOIL-13 and 14). Depending on location, the amount of traffic that occurs on a given road, road conditions, and movement of soils, occurs and allows for sediment transport over various distances at a local or broad-scale level, adding to localized accelerated erosion across the analysis area but cumulatively covering a small percentage of the CIAAs.

Road Maintenance: Additional soil impacts from proposed road maintenance activities such as grading, drainage improvements, and surfacing on existing dedicated roads will be ongoing and would produce localized soil disturbance associated with the use of heavy equipment. Some roads will receive little to no maintenance, especially if restricted or gated.

Recreation, OHV Use, and Other Activities: The analysis area is open for general motorized use that allows for hunting, fuel wood gathering, collection of miscellaneous products, camping, and motorized touring on established roads. Recreation has had localized resource effects by exposing or compacting soil from driving, dispersed camping, or by impacting vegetation (Tables SOIL-13 and 14). Those areas that are frequented by recreationists are disturbed where soils and associated vegetation are permanently or semi-permanently altered from heavy use. Off-highway vehicle (OHV) use does occur in some areas and will continue to have localized impacts on upland soils, especially when it involves unauthorized cross-country trails. Cumulatively, they are of no issue in the Swisher Springs and Swisher FFR CIAAs.

However, with the increase in population in the Treasure Valley and the surge in OHV use, current and future pressures on upland soils are expected to increase, especially if vehicular use and recreation expands beyond existing roads and trails. The greatest cumulative disturbance from recreational use originates from traffic along the nearby Owyhee Scenic Byway (Mud Flat Road) just north of the analysis areas.

A transportation plan for Owyhee County is expected in the near future and may alleviate some concerns associated with OHV use because routes would be designated, reducing cross-country and unauthorized travel. However, products resulting from travel management, such as maps and signage, are likely to result in greater visitor use, which may increase pressure on upland soils and watershed resources. The recent Wilderness and Wild and Scenic River designation along the Owyhee River south of the CIAAs is also expected to increase recreation use of this general area.

Table SOIL-14: Swisher Springs and Swisher FFR allotment CIAA – summary of effects on soils

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Livestock Grazing	Ongoing, continuous	Maximum of 319 AUMS (Swisher Springs) and 127 for Swisher FFR	Across entire analysis area	Moderate	Physical impacts to soils; upland watershed health changes due to shift in less desirable veg species composition
Fences	Most constructed before 1980; few additions each decade	About 18 miles of fence for Swisher Springs and 5 miles for Swisher FFR	Distributed across analysis area, but cumulatively covering a small percentage of area	Low	Short-term, localized construction and maintenance disturbance; chronic cattle trails compact soils

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Water Developments	Most constructed before 1980; few additions each decade	Minimum of 5	Distributed across analysis area, but cumulatively covering a small percentage of area	Low to moderate	Short-term, localized construction and maintenance disturbance; chronic cattle congregation trampling soils
Juniper Cutting	No records	No records	No records	High within cutting areas; moderately low across entire area	Shift to grass/forb/shrub community increases soil stability, hydrologic function, and improves nutrient flow
Prescribed Burning	Mostly in 1980s	About 152 acres	Patchy within analysis area	Moderately high within burn area; low across entire area	Shift to grass/forb/shrub community increases soil stability, hydrologic function, and improves nutrient flow; potential weed increase
Fire Suppression	Ongoing, continuous	Moderately effective given distance to fire facilities etc.	Across entire analysis area	Moderate	Pros: maintains stabilizing ground cover on soils; Cons: long-term shift from grass/forb/shrub community to mostly juniper dominated area with decreased watershed function
Roads	Nearly all in place before 1980	A total of 7 miles for Swisher Springs; 2 miles for Swisher FFR	Distributed across analysis area, but cumulatively covering a small percentage of area	High but localized; overall moderately low	Vegetation community shift results in increased bare soils, decreased soil stability, hydrologic function, and reduced nutrient flow.
Recreation	Ongoing, continuous	Low visitor use; hunting season off-road travel and dispersed camping	Mostly along roads	Low	Localized physical soil and veg impacts
Weed Treatments	Ongoing, continuous	Estimated fewer than 100 acres treated since 1980s	Patchy, mostly along main routes	Low	Increased soil moisture, nutrients, and stability
Structures	In place before 1980	Ranch buildings	Swisher FFR	Moderately high in localized areas; low across entire area	Localized physical soil and veg impacts

3.6.2.3.1 Alternative 1 & 2 Effects

Alternatives 1 and 2 would have direct and indirect effects to upland watershed soil and hydrologic function as described in Section 3.6.2.2. Grazing authorization in the Swisher FFR allotment with implementation of the applicant's proposed action for Alternative 2 would be the same as identified in Alternative 1. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternatives 1 and 2 would cumulatively have a small incremental negative effect on upland soils and their associated processes.

While the cumulative effects would be minor, the unchanged stocking rates in Alternative 1 and increased AUMs in Alternative 2, combined with the utilization of key forage species during critical growth periods, would not improve the overall vegetation health of the uplands. In the absence of adequate recovery periods for plant communities, the negative effects of the grazing scheme would contribute to a cumulative increase in soil impacts and upland erosion. Soil and hydrologic function would be further at risk since limited to no progress toward improved resource issues are made.

Under both Alternatives 1 and 2, the combined effects of the proposed grazing management, lack of improvement to vegetation, and resulting direct and indirect effects to soils would not be beneficial to upland watershed health. When these effects are considered in conjunction with the past, present, and reasonably foreseeable future actions that also affect soils in the CIAA, Alternative 1 has the highest risk to cumulatively increase erosion.

3.6.2.3.2 Alternatives 3, 4, and 5 Effects

Alternatives 3, 4, and 5, which do not apply to the Swisher FFR allotment, would have direct and indirect effects to upland watershed soil and hydrologic function, as described in Section 3.6.2.2. Specifically, the alternatives would improve plant communities at varying magnitudes and result in improved soil and hydrologic function that reduce erosion potential at the corresponding levels. When added to the past, present, and reasonably foreseeable future actions that will affect vegetation and associated upland watershed health, Alternatives 3, 4, and 5 would cumulatively have small incremental positive effects on upland soils and their associated processes.

Alternative 3 includes performance-based terms and conditions that would have desirable direct and indirect effects on soils, despite an increase in stocking rate and initial growing season use. Adequate recovery of plant species composition and biodiversity of desirable key forage species would be promoted through the use of performance-based terms and conditions. The resulting increased soil surface protection and decrease in sediments would have desirable effects on upland soil and watershed health. Considering the past, present, and reasonably foreseeable future actions influencing soils in the CIAA, the impacts from Alternative 3 would have a positive cumulative effect over Alternatives 1 and 2 by decreasing sediment movement that would otherwise be destined to reach riparian areas and streams.

The season-based Alternative 4 is expected to have similar positive cumulative effects as Alternative 3; however, because Alternative 4 would restrict grazing during the critical growth season of desirable key forage species altogether and therefore result in reduced stocking rates that are further decreasing grazing impacts, Alternative 4 would provide additional protection compared to the implementation of Alternatives 1, 2, and 3.

Alternative 5 would provide extended rest from livestock grazing. The improvements would be similar to Alternatives 3 and 4, though the incremental effects associated with the recovery of soil stability, hydrologic function, and nutrient cycling affecting upland soils and watershed health would occur at a faster rate, due to the absence of livestock grazing. Cumulatively, this would offer the greatest benefits to the CIAA.

All three alternatives would maintain and benefit upland soils at varying degrees and result in the capture, storage, and safe release of precipitation, as well as improve energy flow and nutrient cycling in the analysis area. The approximately 4 percent of soils rated for severe erosion potential would experience less risk since improvements toward soil and upland watershed resource issues are made. The proposed changes in grazing management would make progress toward meeting Rangeland Health Standards and ORMP objectives and cumulatively provide improvements to the CIAA.

3.6.3 Special Status Plant Species

3.6.3.1 Affected Environment

Swisher Springs

The plant community in pasture 1 resembled reference conditions for this Shallow Claypan site, with low sagebrush/Idaho fescue/bluebunch wheatgrass habitat. Pasture 2 was burned by wildfire in 2000. Mountain big sagebrush seedlings, the potential dominant shrub for the site, were present, while green rabbitbrush (*Ericameria teretifolia*) and juniper showed a departure from site potential of mountain big sage brush/bluebunch wheatgrass/Idaho fescue. Comments recorded for pasture 3 in the RHFA included loss of bunchgrasses, low vigor of perennial plants, die-off of Sandberg bluegrass, die-off of low sagebrush, and presence of cheatgrass and juniper as invasive species.

Swisher FFR

Upland habitats within the allotment include a mix of big and low sagebrush communities, with a bunchgrass understory dominated by Sandberg bluegrass. Current plant community composition is providing cover, structure and forage for numerous migratory birds and small mammals, including a diversity of species that are critical prey for most raptors including golden eagles, prairie falcons, and ferruginous hawks.

3.6.3.2 Direct and Indirect Effects

Data Collection and Methodology

Information for existing conditions in the Swisher Springs and Swisher FFR allotments was provided through Elemental Occurrence (EO) reports from the Idaho Department of Fish and Game Heritage Program and observation reports from the Owyhee Field Office. The Swisher Springs and Swisher FFR allotments have no SSPS that have known occurrences in these allotments.

Species Elemental Occurrence reports for the Swisher Springs and Swisher FFR allotments were reviewed for Special status plant species (SSPS) updates. According to these reports, there are no known special status plants within the Swisher Springs or Swisher FFR allotments; for this reason, there will be no further analysis.

3.6.4 Water Resources and Riparian-wetland Areas

3.6.4.1 Affected Environment

Introduction

The Swisher Springs and Swisher FFR allotments fall within the Upper Owyhee watershed, hydrologic unit code 17050104. The watershed encompasses a large area in southwest Idaho and forms the headwaters for the Owyhee River, also known as the East Fork, that originate in the Independence and Bull Run Mountains in northern Nevada. Within the Idaho portion of the watershed, there are 15 assessment units (AUs). AUs are groups of similar streams with the same stream order that have similar land use practices, ownership, or land management. These AUs have had total maximum daily loads (TMDLs) completed for sediment and temperature but still do not meet their beneficial uses, which include cold-water aquatic life and primary contact recreation. Two listed units are reservoirs: Juniper Basin and Blue Creek Reservoirs. The goal of the TMDLs is to achieve State of Idaho water quality standards and to restore and maintain a healthy and balanced biological community for the full support of cold-water aquatic life and salmonid spawning. Cold-water aquatic life water bodies are defined as water quality-appropriate for the protection and maintenance of a viable aquatic life community for cold water species.

Streams that occur within the Swisher Springs allotment and are identified by IDEQ as not supporting the beneficial use include Castle and Beaver Creeks and their tributaries. Swisher, Long Meadow, and Moonshine Creeks are all tributaries to Castle Creek. Additionally, Beaver Creek has been placed on the 303(d) list. The streams that traverse pasture 3 in the Swisher Springs allotment are tributaries to Beaver Creek and are also on the 303(d) list. The Swisher Springs FFR includes negligible (less than 0.01 mile) water resources on public lands and the allotment does not contain any streams on the IDEQ 303(d) list.

Based on the National Hydrologic Dataset (NHD), riparian and water resources within the allotment include approximately 22 miles of intermittent and ephemeral[72] streams (about 5.5 miles support riparian vegetation; (USDA FSA, 2011)) and one known spring (Table RIPN-22). The major drainages include Swisher, Long Meadow, and Moonshine Creeks. There is one named spring called Swisher Spring. There are negligible (less than 0.01 miles) riparian and water resources on BLM land within the Swisher FFR allotment.

Table RIPN-22: Total miles of perennial and intermittent streams and number of springs within each pasture

Pasture	Perennial Miles	Intermittent/Ephemeral Miles	# Reservoirs	# Springs
1	0	6.2	0	0
2	0	9.7	0	1
3	0	6.7	0	0

Desired Conditions and Objectives

The EA and the resource objectives tier in part to those identified in the ORMP EIS. The objective specified in the management plan for both riparian-wetland areas and stream channels is to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions. Riparian-wetland areas include streams, springs, seeps, and wetlands. The BLM has primarily utilized the lotic and lentic[73] proper functioning condition (PFC)[74] protocol to measure whether the objective is being met. The PFC assessment is a qualitative determination that refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian-wetland areas. Essentially, a PFC determination rates the state of resiliency that will allow a riparian area to hold together during a high-flow event, which then allows the area to provide desired values (i.e., wildlife habitat).

The ORMP objective for water quality is to meet or exceed State of Idaho water quality standards on all federally administered waters. To assess and interpret whether this objective is met for an area, a stream,

[72] Intermittent: Contains water for only part of the year, but more than just after rainstorms and at snowmelt.
Ephemeral: A stream or stretch of stream that flows in normal water years only in direct response to precipitation and whose channel is above the water table at all times.

[73] Lotic = flowing water. Lentic = standing water, e.g. a seep or pond.

[74] PFC Assessments are based on Interagency Technical Reference 1737-15, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lotic Areas* and 1737-16, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lentic Areas*

and/or a stream segment, the BLM utilizes watershed information collected by IDEQ and collects water temperature and bacteria information internally.

Current Condition

Swisher Springs Pasture 1

According to the NHD, pasture 1 contains approximately 6.2 miles of intermittent stream. The NHD does not differentiate between intermittent and ephemeral streams. An ephemeral stream is defined as one that flows in normal water years only in direct response to precipitation and often does not support riparian plant communities. The intermittent streams in pasture 1 are likely ephemeral and do not appear to support significant riparian vegetation (USDA FSA, 2011).

The tributaries to Castle Creek that traverse pasture 1 are not supporting the beneficial uses assigned to the watershed; however, IDEQ does not have sufficient information to place them on the 303(d) list. BLM does not have any water quality monitoring sites in this pasture.

Swisher Springs Pasture 2

According to the NHD, pasture 2 contains approximately 9.7 miles of intermittent streams and one spring. Many of the streams in pasture 2 are ephemeral and do not support riparian-wetland areas. However, both Swisher and Moonshine Creeks support intermittent flows and riparian-wetland areas. Both streams were assessed with the BLM Proper Functioning Condition (PFC)[75] protocol and are functional-at-risk (FAR)[76] (Map RNGE-7). The lack of riparian vegetation, shrinking riparian areas, livestock trailing, and hoof shearing of riparian soils were noted. Swisher spring was also assessed with the BLM PFC protocol and rated FAR for the same reasons. The spring is developed but is not exclosed from livestock.

Swisher Springs Pasture 3

According to the NHD, pasture 3 contains approximately 6.7 miles of intermittent streams. Most of the streams in pasture 3 are ephemeral and do not support riparian-wetland areas. The unnamed tributary to Deep Creek was assessed with the BLM PFC protocol and was rated in PFC[77].

The tributaries to Beaver Creek that cross pasture 3 are on the 303(d) list of impaired waters (Map RNGE-7). The streams are not meeting the beneficial uses assigned to the watershed, and IDEQ identifies stream temperature and sediment as causes. BLM does not have any water quality monitoring sites in this pasture.

Swisher Springs FFR

There are negligible (less than 0.01 miles) riparian and water resources on BLM land within the Swisher FFR allotment.

3.6.4.2 Direct and Indirect Effects

See the Common to All Allotments Section 3.3.1.4 for general introductory information common for the impact analyses for all allotments and all alternatives.

---

[75] PFC Assessments are based on Interagency Technical Reference 1737-15, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lotic Areas* and 1737-16, *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lentic Areas*

[76] FAR indicates that the riparian-wetland area does not have sufficient vegetation, landform, or large woody debris to dissipate stream energy, filter sediment, aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.

[77] PFC indicates a riparian-wetland area has adequate vegetation, landform, or large woody debris present to dissipate stream energy, filter sediment, aid ground water recharge,aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.

3.6.4.3 Direct and Indirect Effects

3.6.4.3.1 Alternatives 1 & 2 Effects

The grazing schemes proposed under Alternatives 1 and 2 would reauthorize either the current actual use or additional AUMs; however, under these alternatives, the three Rangeland Health Standards (2, 3, & 7) (Appendix K) associated with the riparian and water resources are not being met.

The Swisher Springs allotment contains minimal water-riparian resources, and they occur in pasture 2. Alternatives 1 and 2 would allow grazing in the riparian pasture 2 during summer and fall (7/16 to 10/15) for both years of the cycle. When used during the riparian area growing season, upland grasses are often dry and temperatures are warmer, causing livestock to make disproportionate use of riparian areas, and riparian herbaceous vegetation is preferred (Powell, Cameron, & Newman, 2000). Additionally, when riparian areas are open to grazing every year during the growing season, livestock congregate close to water where it is cooler and the forage is more palatable (Liggins, 1999), (Bryant, 1982), (Smith, Rodgers, Dodd, & Skinner, 1992). Once livestock have congregated along floodplains, in riparian-wetland areas, and in the stream channels, further impacts associated with stream bank trampling (Kauffman, Krueger, & Vavra, 1984), soil compaction (Marlow & Pogacnik, 1985), and water quality (Taylor, Gillman, & Pendretti, 1989) occur (Table RIPN-26). In-stream trampling, disturbance and erosion from denuded banks, reduced sediment trapping by vegetation, loss of bank stability, and increased peak flows lead to reduced habitat quality for both fish and aquatic species, reduced infiltration, and lowered water tables (Stevens, McArthur, & Davis, 1992). An increase in soil compaction created by congregated livestock (especially during spring grazing) causes an increase in erosion, decreased water infiltration rates and more runoff, reduced plant productivity, and thus less vegetative cover (Clary, 1995). Finally, impacts associated with water quality include a potential increase in nutrient concentrations, bacteria, sediment, and water temperatures. Direct fecal deposition into and near water, runoff from disturbed stream banks, and hoof churn up of contaminated sediments increase nutrient and bacteria concentrations (Taylor, Gillman, & Pendretti, 1989). The impacts described would continue to occur if either of these alternatives were implemented.

The addition, the fall grazing period in the riparian pasture 2 would increase the occurrence of browse on the woody riparian species because both upland and riparian herbaceous forage has dried and/or been used (Elmore W. , 1994). The amount of time available for both herbaceous and woody species regrowth would be reduced because grazing would occur through October. However, this system of grazing could be effective when stream bank temperatures are cool enough to discourage animals from congregating in the riparian areas (Bellows, 2003).

Although each area is unique in its particular setting (stream characteristics, valley bottom type and soils, potential vegetation, relationship to upland topography and vegetation) and thus its ability to withstand impacts, in general, under Alternatives 1 and 2, approximately 2 miles of intermittent stream that support riparian vegetation and 4 acres of riparian-wetland area associated with Swisher Spring that occur within pasture 2 would be impacted by summer-fall grazing, as described above. If either of these alternatives were implemented, the riparian and water resource issues and associated impacts would remain the same as the current condition, the resource would continue to be degraded, and the Rangeland Health Standards (2, 3 and 7) would not be met.

3.6.4.3.2 Alternative 3 Effects

Alternative 3 is a performance-based alternative that was developed based on the grazing system that currently occurs. The seasons of use, duration, intensity, and stocking rates would be the same as

Alternative 1; the difference would be the incorporation of performance-based terms and conditions (T&C number 13). For protection of the riparian and water resources, the standards are quantifiable and measurable metrics (Table ALT-1) that would allow the operator and agency personnel to work collaboratively and responsibly to rotate livestock before any of the terms and conditions are exceeded.

The critical riparian-related performance-based terms and conditions for lotic areas (flowing streams) under Alternative 3 include maintaining an herbaceous stubble height of 6 inches, use on the riparian shrubs not to exceed 30 percent, and bank alteration caused by livestock not to exceed 10 percent. For the lentic areas (springs and seeps), the important terms and conditions would be the same, except instead of bank alteration, edge shear of the wet meadow areas would not exceed 20 percent. Positive change would occur within the riparian areas in the Swisher Springs allotment because riparian area condition would improve, the ORMP objective of proper functioning condition would be achieved, and the Rangeland Health Standards associated with water and riparian resources (2, 3, and 7) would be met.

The impacts associated with the seasons of use would be that same as those described for summer-fall use under Alternatives 1 and 2 above. However, compliance with the terms and conditions would allow the 2.0 miles of stream and 4.0 acres of riparian-wetland area to improve in functional condition because livestock would be rotated and/or removed before indicators (i.e., stubble height and woody browse) were exceeded allowing the stream and riparian systems to maintain form and thus function (i.e., water infiltration and aquatic habitat).

3.6.4.3.3 Alternative 4 Effects

Alternative 4 was developed in response to both the existing condition of the allotment (see the Affected Environment section), the impacts affecting the resources present within the allotment, and the resource objectives set in the ORMP.

The water and riparian resources are minimal in the Swisher Springs allotment and occur in small areas of pasture 2 (Map RNGE-7). Under Alternative 4, pasture 2 would be grazed during the spring of 1 year and rested 2 of the 3 years in the cycle. Spring or early-growing-season grazing would provide rest during much of the riparian area growing period, thereby promoting seed and root production (Powell, Cameron, & Newman, 2000). Riparian vegetation would benefit since regrowth occurs every year and woody plant species browse is minimized. Thus, this system of grazing would benefit the riparian system because both the direct impacts, in the form of vegetation removal and livestock trampling, as well as the secondary impacts, such as detrimental changes in stream morphology, increased erosion and sediment loads, decreased water quality, and impaired fish and aquatic habitat, would be reduced.

However, impacts would occur because early-season grazing occurs when soils are typically wet. The static load of a cattle hoof is reported to range from 2.8 to 10.9 kg/cm^2 and can increase by two to four times when the animal travels (Powell, Cameron, & Newman, 2000); thus, when the soils are saturated, the physical damage to the stream banks increase. The increased soil compaction could cause an increase in erosion and sediment loading that would impair water quality and thus fish and aquatic habitat.

Overall, the implementation of Alternative 4 that allows grazing in the riparian pasture before the riparian area growing season, along with 2 years of rest, would minimize the impacts on the riparian and water resource. Specifically, about 2.0 miles of intermittent streams and 4.0 acres of spring riparian-wetland area within pasture 2 would incur only those impacts associated with spring grazing 1 of every 3 years, as described above. Implementation of this alternative would allow the condition of the riparian areas and the water quality to achieve the ORMP objective of both lentic and lotic proper functioning condition, and the Rangeland Health Standards associated with the resources (2, 3, and 7) would be met.

3.6.4.3.4 Alternative 5 Effects

Alternative 5 is a no-grazing prescription. The permit to allow livestock grazing on the authorize 0 AUMs and grazing would not occur for the duration of 10 years.

The elimination of grazing for a period of 10 years would let the riparian ecosystem recover because the rest from livestock would allow for the recovery of the stream bank and a functional riparian plant community. Information is lacking on the length of rest required for recovery of riparian vegetation; however, shrubs often require longer periods of recovery than herbaceous vegetation (Powell, Cameron, & Newman, 2000). Improvement in stream channel form and function would only occur if the channel is at a stage where improvement is possible; for example, downcut systems would need to reach a new base level and widening would have to occur to allow vegetation establishment sufficient to resist higher flows (Leonard & Karl, 1995). Recovery would also be dependent on the levels of degradation and the climatic variables (Bellows, 2003). However, research has found that in ungrazed areas, streams experienced decreased widths and depths (Clary, 1999), vegetation cover increased two-fold, stream bank stability increased by 50 percent (Scrimgeour & Kendall, 2002), and stream bank erosion was 3.3 times less in an ungrazed area compared to an area grazed at a moderate stocking rate and level of use (Kauffman, 1982).

The implementation of the Alternative 5 would have the greatest benefit for the riparian and water resources because the riparian ecosystem would recover most of the structural and functional diversity that occurs within the allotment.

3.6.4.4 Cumulative Effects

Introduction and Scope

Cumulative effect is defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative impacts focus on the aggregate effects of the past, present, and reasonably foreseeable future actions. Reasonably foreseeable actions include activities with completed NEP, scoping, or decisions, and with implementation planned within 3 years.

The water and riparian resource CIAA was set to the IDEQ 5th field HUC (Map CMLV-1) that incorporates and extends beyond the allotment boundary. The watershed is comprised of assessment units that were established to incorporate groups of similar streams with the same stream order, and with similar land use practices, ownership, or land management. The watershed that makes up the CIAA is the Deep Creek watershed. The BLM chose this CIAA because the direct and indirect effects of grazing management on riparian and watershed resources, as well as on specific impacts such as stream sediment and water temperature, can be seen within this IDEQ 5th field HUC. Outside of this area, however, direct and indirect effects of the grazing scheme will not be seen and/or will be too small to create identifiable cumulative effects.

Cumulative Impact Area Activities

The figures in the following table of past, present, and reasonably foreseeable future actions within the analysis area relevant to cumulative impacts were calculated using BLM GIS data. The data used represent the best available information and the calculations based on the data are approximate.

Table RIPN-23: Past, present, and foreseeable actions within the Swisher Springs and Swisher FFR allotments CIAA

Type of Activity	Past and Present	Reasonably foreseeable additions
Grazing	7 active BLM allotments	Permits will be renewed/modified as they expire: 3 to be processed by 2015
Wildfire	9,778 acres (between 1985-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	9,802 acres	None
Noxious Weed Presence	30 infestations	Fewer than 10 acres/year of new infestation anticipated
Roads (all are unpaved)	76 miles	None

Livestock grazing is the dominant land use activity in the area, and almost all of the land area is managed for grazing. In the 1990s, BLM initiated a series of range reform activities in response to poor range conditions. Since the Standards were implemented in 1997, Idaho BLM has reviewed and issued grazing permits on about half of the available allotments in the general area. The final decisions for these allotments have been implemented to make significant progress toward meeting Standards. Allotments in this area are primarily grazed throughout the spring and summer. Additionally, a variety of range improvement projects such as spring developments, fences, cattle guards, and troughs have been implemented across the landscape to aid in livestock grazing management. Allotments that occur completely or in part within the water-riparian resource CIAA and their acreage are shown in table RIPN-24. The allotments in the analysis area are in various stages of the 10-year cycle, and as expiration dates approach, each allotment will be evaluated for rangeland health and progress toward meeting Standards prior to the authorization of a new permit. Overall, past and current grazing in the CIAA has had an adverse effect on riparian and watershed resources because grazing has primarily occurred during the spring and summer months when the riparian area soil and vegetation are most vulnerable. Reasonably foreseeable future grazing is expected to improve the condition of the riparian and watershed at least to make significant progress towards meeting the Idaho Rangeland Health Standards.

Table RIPN-24: Grazing allotments within the Swisher Springs and Swisher FFR allotments CIAA, acres, stream mileage within each, and their permit renewal data

Allotment Name	Acres	Perennial Miles	Intermittent Miles	Year Permit Expires
Big Springs	27,771	4.6	160	2019
Castlehead-Lambert	13,992	5	99	2014
Nickel Creek	22,776	16.8	168	2014
Nickel Creek FFR	3,538	13	44	2014
Trout Springs	21	0	0	2012/2017
Swisher Springs	3851	0	28.4	2016
Swisher FFR	762	0.5	4.9	2020

Wildfire records maintained by the Idaho BLM State Office indicate that approximately 9,778 acres (13 percent of CIAA) burned between 1985 and 2011 within the analysis area. Wildfires have caused disturbances within the watersheds, increasing the potential for overland flows, soil erosion, and increased stream sedimentation. When wildfires have burned and removed riparian vegetation, the compounding impacts, such as increased stream temperatures, loss of water infiltration, decreased bank stability, and impaired aquatic species habitat, have occurred within the CIAA.

Vegetation treatments such as prescribed fires, juniper, conifer, and sagebrush control, and invasive species control have had limited effects within the allotment. Similarly, effects of vegetation treatments within the CIAA have been negligible due to the localized and small areas that have been treated.

There are about 30 areas of weed infestations documented within the analysis area. The small area impacted by these activities has had no measureable effect on the water-riparian resource either in the allotments or the larger analysis area because the areas are too small to be meaningful in the CIAA.

Increasing population in the Treasure Valley and an increasing popularity of off-highway vehicles (OHVs) are creating additional pressures on the water-riparian resources from recreation uses. The recent Wilderness and Wild and Scenic River designation is also expected to increase recreation use of this general area. There are approximately 76 miles of unpaved roads traversing the analysis area. The streams that occur within the area are crossed by roads at an estimated 65 different places. Depending on the amount of traffic that occurs on a given road, the stream crossings increase erosion and sedimentation, and disturb vegetation and aquatic species both on a site specific scale as well as downstream of the crossings.

A transportation plan for Owyhee County is expected in the near future which may alleviate OHV resource concerns because routes would be designated, reducing cross country and unauthorized travel. However, products resulting from travel management such as maps and signage are likely to result in increased visitor use, which may increase pressure on the water/ riparian resources.

Current Condition

The streams within the allotment all flow east into the larger drainage of Deep Creek. The water-riparian resource CIAA (the Deep Creek watershed) is approximately 74,912 acres, and contains about 41 miles of perennial streams, 431 miles of intermittent streams, and 35 springs (NHD). There are 86 miles of stream meeting the assigned beneficial uses and water quality standards, 10 miles that have not been assessed, and 127 miles that are water quality impaired. Additionally, of the water quality impaired streams, 140 miles have been through the reconnaissance process and been placed on the 303(d) list by the State (Map RNGE-1; (Idaho DEQ). Beneficial uses are assigned by the IDEQ on a sub-basin scale and within the CIAA they include: cold water aquatic life, salmonid spawning, and primary and secondary contact recreation (RIPN-25). The majority of the streams in the area are not meeting IDEQ water quality standards primarily due to high water temperatures and sedimentation. Table RIPN-25 provides an overview and the pollutants of concern for the Upper Owyhee River sub-basin.

Table RIPN-25: Upper Owyhee Sub-basin Overview

Hydrologic Unit Code	17050104
Size	1,384,288 acres (total) 1,012,411 acres (in Idaho)
§303(d) Listed Stream Segments	Deep, Pole, Castle, Battle, Shoo Fly, Red Canyon, and Nickel Creeks; Blue Creek and Juniper Basin Reservoirs
Beneficial Uses Affected	Cold water aquatic life, salmonid spawning, primary and secondary contact recreation
Pollutants of Concern	Sediment, bacteria, flow alteration, temperature
Major Land Uses	Rangeland, riparian, forestry, irrigated agriculture

Source: Upper Owyhee Watershed (Idaho DEQ)

3.6.4.4.1 Alternatives 1 & 2 Effects

The direct and indirect effects of Alternatives 1 and 2 (described in Sections 3.6.4.3.1 and 3.6.4.3.2) would impact the riparian areas and the watershed in similar ways because the resource would continue to be degraded due to season-long grazing in the riparian pasture, which would remove hydric vegetation and trample stream banks. When these impacts are analyzed in conjunction with the past, present, and future actions that impact riparian and watershed resources, it becomes apparent that implementation of Alternatives 1 or 2 would have a small incremental negative cumulative effect to the CIAA. Overall, the riparian areas within the watershed would continue to be degraded.

All of the streams within the analysis area have been affected by past and present livestock grazing because the allotments within the CIAA have been, and continue to be, grazed during the vulnerable riparian area growing season. Under Alternatives 1 and 2, the streams in the allotment will continue to be grazed during the riparian area growing season, and these continued impacts, when combined with those occurring on the other allotments within the analysis area, would continue to alter stream banks because deep-rooted riparian vegetation would be removed and channels would be trampled. Consequently, stream channel morphology would change and erosion would increase, all contributing to the degradation of riparian areas and a decrease in water quality in the allotment and in the watersheds. Overall, the small improvements expected in the adjacent allotments would not be enough to offset the continued poor condition of the riparian and watershed conditions within the allotment under either of these alternatives, and the conditions within the CIAA would continue to be degraded.

One of the general impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment and stream temperatures and thus less-suitable aquatic species habitat. The sediment increase from roads occurs where the roads cross the streams (approximately 65 places), after which the effect is apparent downstream of the crossings. Thus, the increase in sediment within the CIAA caused by roads currently impacts approximately 70 percent of the streams. The sediment increase caused by fires occurs because erosion increases when overland flows increase due to the loss of vegetation. Past fires have overlapped with riparian areas and have impacted about 48 miles of stream (10 percent of the mileage within the CIAA). Since the grazing proposed under the alternatives would contribute to an increase in sediment and stream temperatures, it would add to the sediment increase caused by stream crossings and loss of vegetation due to fires, and would contribute cumulatively to the overall impact within the CIAA. The cumulative impact would be small, but when added to the impact from the other activities, the condition of the riparian areas and watersheds would continue to be degraded.

Overall, under Alternatives 1 and 2, the impacts from the proposed action would degrade about 22 miles of intermittent stream within the allotment. When these impacts are added to those of the other area activities, they would add incrementally to and degrade approximately 41 miles of perennial and 431 miles of intermittent streams along with the associated riparian areas and the water quality with the CIAA. The condition within the larger CIAA would be impacted by the additive sediment contributions and associated increase in stream temperatures and decrease in suitable aquatic species habitat. Consequently, the resources would continue to be degraded and would not make progress toward meeting Standards under either of the two alternatives.

3.6.4.4.2 Alternative 3 Effects

The direct and indirect effects from Alternative 3 (described in Section 3.6.4.3.3) would allow sufficient herbaceous and woody vegetation to remain after the growing season to protect the stream banks during high flow events, allow regeneration, and protect riparian soils from physical alterations. When the direct and indirect effects of Alternative 3 are added to the other past, present, and reasonably foreseeable future actions described above, the condition of the streams, springs, and associated riparian-wetland areas within the analysis area watersheds would see an overall small improvement. The improvements in the condition of the streams and springs would lead to increased riparian area function (i.e., increased water infiltration and improved aquatic and fish habitat).

*S*ince present and future proposed changes in grazing management to make progress toward meeting Rangeland Health Standards should be occurring, when the improvements are added to those of this action, there would be an improvement in the condition of the wetlands and riparian areas because an increase in the riparian woody and herbaceous communities would occur. As the plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually, the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the small improvement expected within the allotment would, when added to the improvements expected within the adjacent allotments, allow for an overall improvement in the condition of the riparian areas and watersheds within the CIAA.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sedimentation occurs. Additionally, the vegetation is disturbed which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less suitable aquatic species habitat. Fire directly removes vegetation, increasing the potential for overland flows and erosion; both leading to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a decrease in sediment and stream temperatures, it would incrementally reduce the sediment increase caused by stream crossings and loss of vegetation due to fires, and would cumulatively reduce the overall impact within the CIAA.

Overall, the implementation of Alternative 3 would improve the condition of about 22 miles of intermittent stream that occur within the allotment. The improvement would help offset the impacts from the other activities occurring within the CIAA, the condition of the 43 miles of perennial and 431 miles of intermittent that occur within the analysis area would have a small improvement. Overall, the small improvement expected within the allotment would help with an overall improvement in the condition of the riparian areas and watersheds within the CIAA.

3.6.4.4.3 Alternative 4 Effects

As described above in the direct and indirect effects Section 3.6.4.3.4, Alternative 4 would prohibit summer/growing season grazing in the riparian pastures, which would almost completely eliminate the impacts on the riparian and water resource. Specifically, about 2.0 miles of intermittent streams and 4 acres of riparian-wetland areas associated with springs within pasture 2 would incur only those impacts associated with spring grazing 1 out of every 3 years.

Since livestock grazing is the dominant land use activity in the cumulative analysis area, the impacts of Alternative 4, when added to the present, and future proposed changes in grazing management (to make progress toward meeting Rangeland Health Standards) occurring in surrounding allotments, would improve the condition of the streams, springs, and associated riparian-wetland areas within the CIAA. The improvements in the condition of the streams and springs would lead to increased function (i.e., increased water infiltration and improved aquatic and fish habitat). An increase in woody and herbaceous communities would occur, and as plant communities change, stream banks would stabilize due to increases in deep-rooted riparian vegetation that bind the stream banks. Fine sediments would decrease and stream shade would increase due to the development of riparian communities. Eventually the channels would narrow and deepen and aquatic habitat conditions would improve as channel form recovers. Overall, the improvement expected within the allotment would help improve the condition of the riparian areas and watersheds within the CIAA.

One of the major impacts associated with both roads crossing streams and the loss of vegetation caused by wildfires is an increase in sediment. When vehicles use roadways that cross the streams, an increase in erosion and thus sediment occurs. Additionally, the vegetation is disturbed which also increases the sediment. The loss of vegetation and increase in erosion can lead to an increase in stream temperatures and less suitable aquatic species habitat. The impacts from roads are apparent downstream of the road crossing. Approximately 70 percent of the streams within the CIAA would be subjected to this impact. Similarly, fire directly removes vegetation, increasing the potential for overland flows and erosion; both leading to increased sediment in the streams. Since the grazing proposed under this alternative would contribute to a decrease in sediment and stream temperatures, it would incrementally reduce the sediment increase caused by stream crossings and loss of vegetation due to fires, and would incrementally reduce the overall impact within the CIAA.

The impacts on the water-riparian resources from the action under Alternative 4 that would occur within the allotment would be added to the impacts from the other areas activities and would cumulatively help improve the conditions within the larger analysis area. Specifically, the condition of approximately 41 miles of perennial streams, 431 miles of intermittent streams, and 35 springs that occur within the CIAA could improve.

3.6.4.4.4 Alternative 5 Effects

The cumulative impacts of Alternative 5 that combine extended rest from livestock grazing with any proposed changes in grazing management in adjacent allotments to make progress toward meeting rangeland health Standards would result in greater and faster water-riparian resource improvement than the other proposed alternatives. The impacts would be similar to Alternative 4 because the proposed livestock grazing would move the allotment toward meeting Standards. However, since there would be no livestock grazing, improvement in the resources would occur faster (as previously identified in the effects analyses) and similarly, the incremental effects from the various resource improvement would occur at a faster rate.

3.6.5 Wildlife/Wildlife Habitat and Special Status Animal Species

3.6.5.1 Affected Environment

In addition to the general overview of the affected environment for Wildlife Resources in the Owyhee River allotments presented above (Section 3.3.1.5), descriptions of the current condition of species and their habitats within the Swisher Springs and Swisher FFR allotments are based on the 2012 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2012c) and Determination (Appendix K), affected environments of the Rangeland Vegetation and Water and Riparian Resources within this EA (Sections 3.6.1.1 and 3.6.4.1, respectively), recent personal observations, current element occurrences in IFWIS (IDFG, 2011b), and consultation with local wildlife professionals.

Wildlife Habitat

The Swisher Springs and Swisher FFR allotments are entirely located within the Owyhee Uplands and Canyons Level IV Ecoregion discussed previously (Map WDLF-1; Section 3.3.1.5). Within the allotments the ecoregion is characterized by rolling juniper woodlands, mountain shrub, and shrub steppe on the gentle east slope of Juniper Mountain. Currently, the expansion of juniper into former shrub communities has transformed parts of pasture 2 and 3 into open woodlands with savanna-like conditions. A few riparian areas occur within the higher elevations of pasture 2. Wildlife habitats within the allotments include juniper woodlands, mountain shrublands, sagebrush steppe, grasslands, wet meadow complexes, riparian areas, springs and seeps, and a few small reservoirs (Table WDLF-8; Map WDLF-2). Upland and riparian vegetation within the allotment have been discussed in detail in Sections 3.6.1 and 3.6.4.

Table WDLF-8: Major habitat and general cover types with the Swisher Springs allotment

Habitat Type	General Cover Type	Percentage of Allotment	
		General Cover Type	**Habitat Type**
Grassland	bunchgrass	26	26
Shrub Steppe[1]	big sagebrush	4	69
	mountain big sagebrush	18	
	low sagebrush	47	
Mountain Shrub	bitterbrush	< 1	1
	mountain shrub	1	
Forest	juniper	4	4
Riparian	wet meadow	< 1	< 1
Non-native/Disturbed	exotic annuals	< 1	< 1
	rabbitbrush	< 1	

[1] The spatial data set for general vegetation cover types was prepared by the Pacific Northwest National Laboratory in 2003 and modified by the most current National Agriculture Imagery Program aerial photography (2011) and BLM unpublished wildfire data (2011). These data may be found online or are available from the BLM by request.

[2] Shrub steppe habitat type includes the predominant big and low sagebrush communities in the area. Big sagebrush (*Artemisia tridentata*) cover types include communities dominated by the Wyoming (*Artemisia t. wyomingensis*), and Basin (*Artemisia t. tridentata*) subspecies, as well as mixed communities dominated by either subspecies. Mountain big sagebrush (*Artemisia t. vaseyana*) and low sagebrush (*Artemisia arbuscula*) cover types comprise the remaining sagebrush communities.

Wildlife Habitat and Wildlife Species

The habitat and wildlife including special status species within the allotments are the similar to those identified in the Castlehead-Lambert allotment (Section 3.4.5.1) with the following differences. Although the native vegetation communities that comprise uplands habitats within the allotment indicate slight departure from reference conditions, upland habitats are structurally and functionally providing suitable breeding and foraging habitat for sagebrush-obligate and shrub-dependent special status species such as greater sage-grouse, pygmy rabbits, Brewer's sparrows, loggerhead shrikes, and sage sparrows. Although upland wildlife habitat conditions within the Swisher Springs allotment are providing adequate composition, structure, and function for most if not all special status species, this is not the case in riparian areas. Due to a lack of hydric vegetation and soil instability along streambanks in the few riparian/wetland habitats that occur within the allotment (Section 3.6.4.1), significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) is not occurring.

Herbaceous riparian vegetation use and streambank trampling by livestock have reduced the size of the riparian areas (Section 3.6.4.1), as well as nesting substrate, protective cover, and foraging areas for many riparian-dependent special status wildlife species such as northern goshawks, calliope hummingbirds, willow flycatchers, and some special status bat species like fringed myotis. Overall, riparian areas are not providing adequate nesting structure and cover for dependent species due to a lack of herbaceous and woody species such as willows and aspen in particular. In addition, current degraded riparian/wetland conditions are probably limiting late-brood rearing habitat use by greater sage-grouse. Although the allotment has been surveyed for spotted frogs, no occupied habitat was found.

Historically, the majority of the allotments provided suitable habitat for sage-grouse and supported significant populations (USDI BLM, 1969). Currently, PPH occurs throughout the Swisher Springs allotment (Map WDLF-7). Within the allotment, PPH includes all three subcategories (i.e., sagebrush, perennial grasslands, and conifer encroachment areas; Table WDLF-9; Map WDLF-7). Much of the PPH within allotment is identified as sagebrush-limited (i.e., perennial grassland and juniper encroachment; Map WDLF-7). Sagebrush PPH within the allotment is adjacent to areas of juniper encroachment as well as on the periphery of large contiguous areas of PPH-sagebrush to the east (Map WDLF-7).

Table WDLF-9: Sage-grouse habitat acreage within the Swisher Springs allotment, 2012

Pasture	**Preliminary Priority Habitat (PPH)**			
	Sagebrush	**Perennial Grassland**	**Conifer Encroachment**	**Total**
1	519	183	450	1152
2	1	1119	632	1752
3	143	590	214	947
Total (% of allotment)	663 (17 %)	1892 (49 %)	1296 (34 %)	3851 (100 %)

Currently, usable sage-grouse habitats are mostly limited to the lower elevation portions of pastures 1 and 3 (Map WDLF-7). A sizeable portion of potential sage-grouse habitat within the allotment has been converted to early seral or open juniper woodlands. In addition, substantial portions of pasture 2 and 3 are composed of perennial grasslands due to recent wildfires (62 and 63 percent, respectively; Table WDLF-9; Map WDLF-7; (USDI BLM, 2012c)). The few incidental observations of sage-grouse that have occurred within the allotment indicate that areas of PPH-sagebrush provide nesting, brood-rearing, and summer habitat. Pastures 1 and 3 have areas of PPH-sagebrush that are providing nesting and brood-rearing habitat although distribution of these seasonal habitats is limited to relatively small patches in a landscape dominated by low sage and perennial grasslands interspersed with junipers ((USDI BLM, 2012c) p. 39-41). Breeding habitat within the allotment may be somewhat limited by patch size; however, it appear to be suitable especially considering its proximity to large areas of usable PPH-sagebrush in adjacent allotments. Overall, breeding and brood-rearing habitat conditions were rated as suitable ((USDI BLM, 2012c) p. 39-41). Preferred forbs were common and included a diversity of species; trend frequency plots indicated the presence of numerous additional preferred species. Large areas of all pastures are comprised of low sagebrush communities that may provide winter habitat within the allotment as well. Currently, higher-elevation areas that previously provided summer habitat along streams and at springs and seeps are experiencing juniper encroachment or have burned and sagebrush cover is limited. No leks occur within the allotments, but sage-grouse nesting may occur in pastures 1 and 3. Nesting grouse in the allotment probably attend lek 2O310 (Section 3.4.5.1).

3.6.5.2 Direct and Indirect Effects

3.6.5.2.1 Alternative 1 Effects

Because the livestock grazing that has occurred under Alternative 1 has led to the current condition for upland and riparian wildlife habitats, it will serve as the baseline for comparison to the other alternatives. Grazing at the current management level has been shown to reduce cover and forage for wildlife in riparian areas and lead to trampling and breakdown of streambanks (Sections 3.6.4.3.1). Continuation of hot-season grazing would concentrate livestock use on riparian areas, thus decreasing riparian vegetation that wildlife use for nesting substrate, cover and foraging habitat. Streambank trampling would add sediment into streams and increase channel width to depth ratios which increase water temperatures and decrease water quality to unacceptable levels for some fish and amphibian species. Effects of livestock grazing on wildlife habitats and wildlife species including those with special status are the same as those identified in Section 3.4.5.2.1. Although habitat conditions are expected to remain static in upland habitats at lower elevations, significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would not occur due to the continuation of degraded habitat in riparian areas.

3.6.5.2.2 Alternative 2 Effects

Direct and indirect effects of livestock grazing management under Alternative 2 would be similar to those described in Section 3.6.5.2.1. Effects from the minor increase of 23 AUMs would be negligible. However, significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would not occur due to the continuation of degraded habitat in riparian areas.

3.6.5.2.3 Alternative 3 Effects

Direct and indirect effects of livestock grazing management under Alternative 3 would be similar to those described in Section 3.6.5.2.1 with the following differences. Under Alternative 3 substantial improvements to wildlife habitat in uplands and riparian areas would be realized over the term of the permit. Implementation of Alternative 3 would include performance-based terms and conditions that were developed to protect and enhance native plant communities in the uplands and riparian areas for special status species and other wildlife, as well as breeding, brood-rearing, and foraging habitats for sage-grouse. In addition to the terms and conditions discussed in Sections 3.6.1.2.3 and 3.6.4.3.2 (#13 and #14, respectively), which would also benefit upland and riparian wildlife habitats, the term and condition in Alternative 3 specific to sage-grouse breeding habitat (#15) includes a measurement of perennial herbaceous vegetation height in PPH-sagebrush in pastures 1 and 3. Compliance with the term and condition would maintain suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season.

Under Alternative 3, upland wildlife habitat would improve in comparison to current conditions because compliance with the short-term indicator of limiting utilization of key forage species to levels less than or equal to 20 percent would allow for the recovery and maintenance of healthy, vigorous, and productive perennial bunchgrasses and native rangeland vegetation communities. Healthy vegetation communities provide the structure (e.g., physical patterns of life forms, individual physiognomy), function (e.g., energy flow, nutrient cycling), and composition (e.g., genetic, species, and ecosystem diversity) many wildlife species require to maintain robust and viable populations. Additionally, riparian wildlife habitat would improve substantially for dependent species (e.g., migratory birds, spotted frogs, and redband trout) under Alternative 3 in comparison to current conditions because compliance with short-term indicators would maintain an herbaceous stubble height of at least 6 inches, a riparian shrub use level less than 30 percent, and limit bank and lentic edge alteration (less than 10 percent and less than 20 percent, respectively), thereby providing greater structural diversity and cover for wildlife species to nest, breed, forage, and conceal themselves. Recovery of wildlife habitat within the allotment, particularly riparian area, could occur in the short term (depending on the current degradation and ecological resiliency of the site) and would continue through the term of the permit; significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

Greater sage-grouse

Under Alternative 3, sage-grouse habitat in upland and riparian areas in pastures 1, 2, and 3 would be enhanced in comparison to Alternative 1, primarily due to an increase in perennial herbaceous vegetation cover (which provides greater concealment cover and protection from predators) and an overall improvement in vegetation community health and composition. These improvements would be the direct result of compliance with the performance-based terms and conditions (#12-#15). Improvements to sage-grouse brood-rearing habitat stability and forage availability and nesting cover would primarily result from compliance with performance-based terms and conditions #14 and #15 (average riparian herbaceous stubble height of at least 6 inches and average perennial herbaceous vegetation heights of at least 7 inches, respectively); whereas compliance with performance-based term and condition #13 (limit growing season utilization at less than or equal to 20 percent) would improve brood-rearing and summer habitats by allowing for healthy, vigorous, and diverse vegetation communities that could provide an abundance of prey (i.e., insects) and forage species. In addition, compliance with performance-based term and condition #13 potentially could increase concealment cover indirectly if utilization limits increase the quantity and vigor of desirable deep-rooted, tall-structured bunchgrasses which under typical growing conditions would likely result in average perennial herbaceous vegetation heights over 7 inches.

Grazing under Alternative 3 could occur during the critical growing season in pasture 1 and 3 every other year. However, because utilization would not exceed 20 percent in pastures 1 and 3 in years they are grazed due to compliance with term and condition #13, perennial bunchgrasses and upland vegetation communities would be maintained and even enhanced from current conditions due to increased vigor over the short term (3 to 5 years). Although utilization could reach 50 percent in pasture 2 every year, uplands are expected to continue to improve in habitat composition, structure, and function because AUMs, season of use, and rest are the same as under Alternative 1 grazing practices which are currently meeting Idaho rangeland standards (Section 3.6.1.1; (USDI BLM, 2012c)).

Implementation of Alternative 3 with its performance-based terms and conditions specifically targeted at improving specials status species (i.e., migratory birds, sage-grouse, Brewer’s sparrow, sage sparrow, loggerhead shrike, spotted bat, etc.) and their habitats in particular complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular “to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

3.6.5.2.4 Alternative 4 Effects

Direct and indirect effects of livestock grazing management under Alternative 4 would be similar to those described in Section 3.6.5.2.3 with the following differences. Wildlife habitat in upland and riparian areas would improve throughout the allotment due to a reduction in AUMs, an overall increase in acres/AUM, and the addition of rest and deferment. Utilization levels are expected to decrease and likely result in greater forage and cover for wildlife due to a reduction in AUMs, which would result in an overall increase in acres/AUM. Riparian habitat in pasture 2 would improve substantially due to rest 2 of every 3 years, and an early season of use which would reduce livestock concentration in riparian areas because cattle would spend more time in the uplands where succulent grasses would be readily available during the growing season (Section 3.6.4.3.3). Improvement to riparian habitat in pasture 2 would result in increased structural diversity of woody species and increased herbaceous vegetation in the understory which would provide riparian associated species with adequate nesting and foraging substrates and cover. The subsequent increase in cover and forage for wildlife in upland and riparian areas (Sections 3.6.1.2.4 and 3.6.4.3.3) are expected to occur over the short term (3 to 5 years) and the term of the permit. Riparian habitats are expected to recover and improve and significant progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) would occur.

Focal Special Status Animal Species

<u>Greater sage-grouse</u>
Under Alternative 4, sage-grouse habitat quality in upland and riparian areas in all pastures would improve in comparison to current conditions primarily due to a reduction in AUMs, changes in season of use, and periodic rest and deferment. Under Alternative 4, pastures 1 and 3 would be deferred 2 out of every 3 years, meaning grazing would only occur in pasture 1 and 3 during the nesting season 1 out of every 3 years, which would eliminate potential direct effects of livestock to sage-grouse nests and eggs such as displacement from leks, trampling of eggs and nests, and subsequent nest desertion in those years. In addition, in the absence of spring cattle grazing, nesting and early brood-rearing cover would not be actively removed during the breeding season which would result in an increase in protective cover. Over the term of the permit, vegetation community composition, structure, and health would improve overall in the absence of growing season use 2 of every 3 years resulting in an increase in abundance and vigor of perennial bunchgrass and therefore increased protective cover for nesting sage-grouse.

Because perennial herbaceous vegetation heights in pastures 1 and 3 average more than 7 inches at the beginning and end of the nesting season under current conditions, under the 34 percent reduction in AUMs associated with Alternative 4, perennial herbaceous vegetation heights are expected to continue to conform with recommended guidance (Connelly, Schroeder, Sands, & Braun, 2000). Based on historical utilization data for pasture 1 and 3 (approximately 32 percent or conservative use, *sensu* (Holechek, Baker, Boren, & Galt, 2006)), continuation of conservative use levels or less would be expected with a 34 percent reduction in AUMs overall. Conservative use, deferment, and periodic rest would result in improved native perennial plant health and vigor and improvements in sage-grouse nesting and concealment cover in comparison to Alternative 1. Collectively, these changes could improve nesting success and juvenile survival and potentially lead to population increases.

Under Alternative 4, sage-grouse habitat conditions in pasture 2 also would improve in comparison to Alternative 1. Pasture 2 would not be grazed during the hot season and would be rested 2 out of every 3 years. Within pasture 2, the spring season of use and reduction in AUMs would provide the greatest benefits for the recovery of sage-grouse habitat. Brood-rearing habitat in meadows and riparian areas are expected to improve in comparison to Alternative 1 because livestock grazing is more likely to occur in upland habitat during spring use, sparing riparian areas of the heavy use they currently experience.

Because wetland and riparian areas would incur less use, herbaceous vegetation and woody species would have the ability to increase and provide more cover and forage for sage-grouse and their broods.

Based on historical utilization data for pasture 2 (approximately 35 percent or conservative use *sensu* (Holechek, Baker, Boren, & Galt, 2006)), utilization is expected to remain at the conservative level or less (i.e., less than or equal to 35 percent), considering the 34 percent reduction in AUMs in the pasture; light to conservative use is consistent with improving native perennial plant health and vigor (Holechek, Gomez, Molinar, & Galt, 1999), which would correspond with recovery of sagebrush, other shrubs species, and tall-statured, deep-rooted perennial bunchgrasses. Recovery of the shrub steppe vegetation community in perennial grasslands that comprise the majority of pasture 2 would lead to progress in the restoration of sage-grouse nesting habitat over the term of the permit.

Implementation of Alternative 4, with its attendant reduction of AUMs and change in season of use specifically targeted at improving riparian habitats for special status species and riparian-associated wildlife and restoring sage-grouse nesting and brood-rearing habitat, complies with objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

3.6.5.2.5 Alternative 5 Effects

Extended rest would dramatically improve conditions for all species of wildlife throughout the Swisher Springs and Swisher FFR allotments. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. In general, all of the negative effects associated with grazing identified in this EA would cease across the allotment. Wildlife habitats would recover and improve over the term of the permit or sooner, especially in aquatic and riparian/wetland areas with the absence of the effects due to previous annual hot-season cattle grazing. Overall, the allotment would become much more diverse and productive as wildlife habitats improved and population numbers for most species increased. Terrestrial and aquatic wildlife habitat objectives would be met and there would be substantial progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals).

Focal Special Status Animal Species

<u>Greater sage-grouse</u>

Under Alternative 5, sage-grouse would benefit from the removal of livestock from the allotment because the negative effects of livestock grazing would no longer occur to the species or their habitat. Potential negative effects of livestock grazing on sage-grouse include trampling of eggs and subsequent nest desertion, and degradation, loss, and avoidance of formerly suitable habitat (Beck & Mitchell, 2000). With the removal of livestock, nesting structure and cover are expected to increase in uplands, along with a similar increase and improvement of late brood-rearing habitat in meadows and riparian areas. Sage-grouse have been shown to select brood-rearing habitat with taller grasses and increased herbaceous cover; increased herbaceous biomass is correlated with invertebrate prey abundance and the increased vertical and horizontal cover it affords most likely imbues greater protection from predators both of which could increase juvenile survival (Kaczor, et al., 2011). Under Alternative 5, improved habitat conditions could result in higher nesting success, juvenile survival, and productivity which could increase local population numbers.

Because implementation of Alternative 5 would exclude livestock disturbance and all associated impacts from important PPH-sagebrush near one of the Owyhee subpopulation's largest leks, the alternative complies with the objectives of the BLM special status species policy in Manual 6840 (USDI BLM, 2008); in particular "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

3.6.5.3 Cumulative Effects

Although the scope, past, present, and foreseeable future actions, and current conditions of the cumulative effects analysis area for the Swisher Springs allotment and Swisher FFR are the same as those described in Section 3.4.5.3, they are summarized briefly below for immediate reference.

Scope

The cumulative effects analysis area for fish and wildlife resources is delineated by the approximately 5.7 million-acre Owyhee sage-grouse subpopulation (Map CMLV-3) (Connelly, Knick, Schroeder, & Stiver, 2004). Given the current conservation importance of greater sage-grouse, it is logical, if not imperative, to choose an analysis area that is biologically relevant to the species. The Owyhee subpopulation area also provides meaningful context and relevance for large and/or highly mobile species (e.g., big game, raptors, and migratory birds) while greatly exceeding the range of many resident fish and wildlife species. Analysis timeframes include past activities that have created the present conditions, and future activities planned within the next 3 years, including the expected duration of effects from current and future activities (generally 10 to 20 years).

Current Conditions

The past, present, and reasonably foreseeable future actions within the cumulative effects analysis area relevant to fish and wildlife resources have been previously presented in Table WDLF-4. In much of the analysis area, upland, riparian, and stream habitats have been adversely affected by grazing practices and rangeland management infrastructure, wildfire, vegetation treatments, and habitat fragmentation due to buildings, roads, and transmission line. As a result, wildlife habitat and populations in the analysis area has been altered from the conditions before Euroamerican colonization of North America and what would be expected under a natural disturbance regime. The current conditions of the past, present, and reasonably foreseeable future actions have been described previously in Section 3.4.5.3.

Deer, elk, pronghorn, and bighorn sheep are common in the analysis area and long-distance, interstate movements to seasonal ranges have been documented. The surrounding deep canyons of the Owyhee River system provide relatively undisturbed cliff nesting habitat for a variety of wide-ranging raptors and bird species. The shrub steppe ecosystem is well represented within the cumulative effects analysis area and provides vital habitat for many shrub-dependent species such as sage-grouse, Brewer's and sage sparrows, loggerhead shrike, and pygmy rabbits. Although populations of some notable species (e.g., sage-grouse) have declined range-wide, population trends in the analysis area for most fish, wildlife, and special status species are unknown because long-term monitoring data are lacking. Across their distribution, sage-grouse and bighorn sheep have been impacted by disease (i.e., WNV and pneumonia, respectively). Although these diseases currently do not appear to be an issue with local sage-grouse and bighorn sheep, WNV has been documented in sage-grouse in Idaho. There appears to be a relatively low risk of contraction of pneumonia by Owyhee River PMU bighorn sheep because the primary vectors of transmission, domestic sheep, do not overlap with the local population (i.e., Owyhee River PMU in Idaho and the Upper Owyhee River Herd in Oregon collectively).

3.6.5.3.1 Alternative 1 and 2 Effects

Under Alternatives 1 and 2, grazing management has been shown to reduce cover and forage for wildlife in riparian/wetland habitats. Continuation of grazing management under these alternatives would decrease riparian vegetation that wildlife use for nesting substrate, cover, and foraging habitat. These effects would negligibly contribute to an overall decrease in the quality of wildlife habitat throughout the cumulative effects area. The continued degradation of riparian habitats would negatively affect habitat for many species of migratory birds.

When these factors are combined with the past, present, and reasonably foreseeable future actions that have impacted wildlife habitats within the cumulative affects area, the deteriorated riparian habitat conditions within the Swisher Springs allotment would not meet ORMP wildlife and special status species management objectives. Because conditions are not expected to improve in riparian habitats, significant progress toward meeting the Idaho rangeland health standard for special status animals would not occur due to the continuation of hot-season use annually which degrades riparian vegetation communities and jeopardizes site stability. Due to the small amount of PPH-sagebrush within the allotment in comparison to the size of the cumulative effects area, the threshold for unacceptable change in the majority of fish and wildlife population including the Owyhee sage-grouse subpopulation most likely would not be exceeded.

3.6.5.3.2 Alternative 3 and 4 Effects

Under Alternatives 3 and 4 substantial improvements to wildlife habitat in upland and riparian areas would be realized over the term of the permit. Implementation of Alternatives 3 and 4 would include performance-based terms and conditions and seasoned-based conservation measures, respectively developed to protect and enhance native plant communities in the uplands and riparian areas, thereby improving breeding, brood-rearing, and foraging habitats for sage-grouse and other upland and riparian wildlife species. The performance-based and season-based approaches would implement grazing practices that would provide suitable nesting cover for sage-grouse by ensuring perennial herbaceous vegetation heights of at least 4 inches at the beginning of the nesting season and at least 7 inches at the end of the nesting season throughout PPH-sagebrush within the allotment. The expected improvements from proposed grazing management considered cumulatively with other activities should benefit wildlife habitat and populations overall. Such improvements would contribute, albeit negligibly, to more robust regional fish and wildlife populations.

Sage-grouse PPH-sagebrush within the allotment is limited but connected to large areas of sagebrush habitat to the east. Adjacent shrublands are comprised of large areas of contiguous, intact sagebrush habitats in the Nickel Creek allotment and the Bruneau Field Office. Trend information for the Owyhee subpopulation is limited as leks are surveyed infrequently primarily due to inaccessibility. Nevertheless, sage-grouse habitat within the allotment most likely represents the periphery of the range of the local population (i.e., deme). Any adverse effects occurring in the allotment would probably have minimal consequences to the Owyhee subpopulation. Trends in sage-grouse populations at the broadest scale in this analysis (i.e., population level) are more readily available. A recent analysis shows that the proportion of active leks and the average number of males per active lek has decreased over the past 40 years within the Northern Great Basin population (Garton, et al., 2011). The minimal effects to the local sage-grouse deme from grazing management actions occurring in the Swisher Springs allotment would have a negligible effect on the viability of the regional Northern Great Basin population or the species range-wide.

Although improvement to wildlife and sage-grouse habitats at the allotment level are expected under Alternatives 3 and 4, and direct and indirect effects from grazing management of this project are expected to be relatively localized, cumulative effects from this project, along with other past and ongoing activities within the cumulative effects area, are not likely to negatively affect any special status species' viability in a substantial way, nor lead to the need for any listing under the ESA. Recovery of wildlife habitat within the allotment could occur in the short term under these alternatives and would continue through the term of the permit. Significant progress toward meeting the Idaho rangeland health standard for special status animals would occur. The threshold for unacceptable change in the majority of wildlife populations including the Owyhee sage-grouse subpopulation most likely would not be exceeded due to the small size of the allotment in relation to the cumulative effects area

3.6.5.3.3 Alternative 5 Effects

The extended rest under Alternative 5 would depart markedly from the predominant grazing systems in the analysis area, creating a relatively small and local area undisturbed by livestock grazing. Extended rest would improve conditions for all species of wildlife throughout the Swisher Springs and Swisher FFR allotments. Vegetative structure and diversity, perennial herbaceous vegetation heights and residual cover, and available forage would increase in all habitat types. Springs and stream riparian habitat would expand and improve. Disturbance from livestock and associated management activities would not occur. The undisturbed mosaic of habitats could augment wildlife populations in the allotment and could provide a productive source area for surrounding allotments.

Cumulative effects to sage-grouse and their habitats within the cumulative effects area would be the same as those described above for Alternatives 3 and 4. Wildlife objectives would be met and there would be substantial progress toward meeting Idaho rangeland health standard for special status animals. Progress would be realized toward improving wildlife habitat conditions below the threshold of unacceptable change. The expected improvements considered cumulatively with other activities should benefit wildlife habitat and populations overall. However, improving wildlife populations within the allotment would negligibly contribute to more robust regional wildlife populations.

3.6.6 Recreation

3.6.6.1 Affected Environment

The Swisher Springs and Swisher FFR allotments are located within the Owyhee Extensive Recreation Management Area (ERMA). The main recreational activities within these two areas are hunting, camping, sight-seeing, backpacking, horseback riding, and nature study.

The OHV designations for the allotment and FFR are limited to Existing.

The ROS classification is used to characterize the type of recreational opportunity settings, activities, and experience opportunities that can be expected in different areas of public land. The Swisher Springs and Swisher FFR allotments contain only two settings for recreationists: Semi-primitive Non-motorized and Semi-primitive Motorized. These classifications have been described above (Section 3.4.6.1).

3.6.6.2 Direct and Indirect Effects

3.6.6.2.1 Alternative 1 Effects

Effects to recreation would be the interaction with livestock during periods of livestock use. During periods of non-livestock use, no impacts would be expected. Areas that were improving under the current grazing system would likely continue to improve and provide enhanced opportunities for recreation. Hunting is the most likely recreation opportunity to be impacted, as grazing within pasture 2 would overlap with some big-game seasons. Additionally, the summer and fall grazing within pasture 2 would have some negative effects to riparian areas, which could also impact recreationists as visual resources are affected. These impacts are considered to be minimal.

3.6.6.2.2 Alternative 2 Effects

Effects associated with this alternative would be the same as those identified in Alternative 1.

3.6.6.2.3 Alternative 3 Effects

The proposed performance-based terms and conditions that are associated with this alternative would make it more beneficial to recreationists than Alternative 1. As conditions of the area improve, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area. Human/livestock interactions would still occur under this alternative as grazing schedules overlap with big game hunting seasons, however, these impacts are considered negligible.

3.6.6.2.4 Alternative 4 Effects

The proposed season-based alternative, in combination with fewer AUMs and reduced livestock numbers, would reduce interactions between livestock and recreationists. Hunting is still the most likely recreational activity to be affected as there would still be some overlap with some big-game hunting periods, however these impacts are negligible.

As conditions of the area improve due to the season-based use and fewer AUMs and livestock numbers, visual qualities would also begin to improve throughout the area, thus creating a more positive recreation experience. Improved conditions could also potentially result in increased hunting success as more wildlife utilizes the area.

3.6.6.2.5 Alternative 5 Effects

This alternative would provide the greatest benefit to recreationists within the allotments. There would be no interaction between livestock and recreationists, and as the overall conditions of the area improved so would visual quality, thus creating a more enjoyable recreation experience. Improved wildlife habitat conditions would increase wildlife viewing opportunities and potentially result in increased hunting success.

3.6.6.3 Cumulative Effects

Cumulative effects would be similar to those discussed in Section 3.4.6.3.

3.6.7 Visual Resources

3.6.7.1 Affected Environment

Both the Swisher Springs and Swisher FFR allotments are categorized as Class IV VRM.

3.6.7.2 Direct and Indirect Effects

3.6.7.2.1 Alternative 1 Effects

The grazing schedule under Alternative 1 would maintain existing visual conditions of the area in the uplands. Upland vegetation throughout the allotment would remain static, and the proposed grazing schedule would not contribute toward any failures to meet Idaho Rangeland Health Standards for upland vegetation.

The summer/fall grazing system would continue to impact riparian areas within the allotment, thus affecting visual resources. However, within Class IV VRM, these impacts are considered acceptable.

3.6.7.2.2 Alternative 2 Effects

Impacts associated with the proposed alternative would be similar to those discussed in Alternative 1.

3.6.7.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial to visual resources throughout the area than Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are being met and conditions of the area are improving, which would be beneficial to visual resources throughout the allotment. Any impacts to visual resources associated with the proposed grazing system would be negligible and are considered acceptable with the VRM objectives for the area.

3.6.7.2.4 Alternative 4 Effects

The effects associated with the proposed grazing schedule under this alternative would be beneficial to visual resources throughout the area. The proposed season-based alternative in combination with fewer AUMs and reduced livestock numbers would improve the overall health and visual quality of the allotment. Areas that are currently improving would continue to do so, and areas that have been affected by heavy livestock use would also begin to show improvement.

3.6.7.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest amount of benefits to visual resources across the board. There would be no effects to upland vegetation and riparian areas due to livestock grazing, thus improving the overall health and visual quality throughout the allotment.

3.6.7.3 Cumulative Effects

Cumulative effects would be similar to those discussed in Section 3.4.7.3.

3.6.8 Wilderness and Wild and Scenic Rivers

3.6.8.1 Affected Environment

There are no wilderness areas or wild and scenic rivers within the Swisher Springs and Swisher FFR allotments.

3.6.9 Lands with Wilderness Characteristics (Outside of Designated Wilderness)

3.6.9.1 Affected Environment

The Swisher Springs and Swisher FFR allotments consist of a portion of two units that contains LWCs. These units are identified as: 106-44 – Deep Creek-Nickel Creek and 106-47 – West Fork Red Canyon.

A portion of both Units 106-44 and 106-47 were part of Wilderness Study Areas (WSAs) known as Upper Deep Creek WSA and West Fork Red Canyon WSA. In 2009, Congress passed the OPLMA, designating more than 500,000 acres of wilderness in Owyhee County. The OPLMA also released several WSAs, including the Upper Deep Creek and West Fork Red Canyon WSAs, and opened these lands up to other uses, as per the recommendation of the 1991 Idaho Wilderness Study Report (USDI BLM, 1991).

Unit 106-47 has previously been described in section 3.4.10.2.1. Unit 106-44, which only comprises approximately 105 acres within the Swisher Springs Allotment and roughly 55 acres within the Swisher FFR, was identified as having LWCs is listed and described below:

Unit 106-44 Deep Creek-Nickel Creek

This unit contains 40,486 BLM-administered acres. The unit consists of several broad tables and areas of rolling to rough topography dissected by small draws and three deep canyon systems. The area drains southerly via Deep Creek, Pole Creek, and Nickel Creek. Their confluences are in the southern portion of the unit.

The northwest portion of the unit is dominated by juniper with open areas of shrub/grass vegetation. Most of the remainder is dominated by northern desert shrubs and grasses with scattered patches of juniper located primarily at the canyon breaks. The canyons support riparian shrub vegetation, while some of the smaller drainages contain seasonal wet meadows.

The central portion of this unit became part of the Upper Deep Creek Wilderness Study Area and was later released in 2009. The unit is used for grazing.

There are five primitive routes and one short, low standard road along the eastern periphery of the unit. These routes are mostly associated with small stock ponds or reservoirs. Another primitive route runs along the western rim of Deep Creek through the center of the unit just north of the confluence with Nickel Creek.

From the confluence of Deep Creek and Nickel Creek, a partially bladed fence line extends along the western rim of Deep Creek. This fence also runs through state land north of the confluence of Deep Creek and Nickel Creek and across the shallow basin between the two canyons to the centrally located primitive route. The western half of the unit has five small stock ponds.

The intrusions are widely and evenly scattered over relatively flat terrain in the easternmost portions of the unit. Because of their distribution and flat terrain, the intrusions are substantially unnoticeable except at close distances. Intrusions in the western half are more widely scattered and less noticeable. The unit as a whole appears to be affected primarily by the forces of nature.

Stands of juniper offer good vegetative screening in the northwest portion of the unit. Riparian vegetation in the canyons also provides good screening. The majority of the unit lacks effective vegetative screening because of the dominance of northern desert shrubs and grasses.

The sheer walled canyon area in the core of the unit offers excellent topographic screening. Though the canyons would tend to concentrate visitors in narrow use corridors, the rugged meandering character of the canyons can effectively screen visitors from each other. Topographical screening over much of the remainder of the unit is marginal because of the lack of significant relief.

The relatively large size and good configuration combined with excellent topographic screening throughout the canyon areas affords outstanding opportunities for solitude.

The primitive and unconfined recreation opportunities within the unit are primarily associated with the canyon areas. They include camping, backpacking, day hiking, nature photography, sightseeing, horseback riding, hunting, and fishing.

The quality of recreational opportunities is considered outstanding because of the units' relatively large size, and exceptional or unusual natural features and recreational attractions. There are significant physical and mental challenges associated with the recreational opportunities.

Deep Creek and Nickel Creek cut scenic canyons through layers of rhyolite and basalt rock.

3.6.9.2 Direct and Indirect Effects

3.6.9.2.1 Alternative 1 Effects

The effects to LWCs from the continued grazing schedule would be impacts to naturalness and visual resources within riparian areas. These areas would be impacted by summer/fall grazing practices and resources associated with riparian areas would continue to be negatively affected; rangeland health standards would not be met. Continuation of the current management strategy would impact, but not impair, the naturalness of LWCs identified in Unit 106-47 if conditions are not maintained or improved.

Upland vegetation throughout the allotment would essentially remain in its existing condition and therefore there would be no impact to those vegetative communities or the area's naturalness. Additionally, there would be no impacts to solitude or primitive and unconfined recreation in this alternative.

Overall, this alternative would encounter some impacts due to livestock grazing within select riparian areas if conditions aren't maintained or improved; however, the impacts would not impair the LWCs or their values.

3.6.9.2.2 Alternative 2 Effects

Impacts associated with the proposed alternative would be similar to those described in Alternative 1. Upland vegetation is expected to continue to meet rangeland health standards; however, riparian areas would continue to be affected from summer/fall grazing practices, thus impacting the area's visual qualities and naturalness.

3.6.9.2.3 Alternative 3 Effects

The effects of this alternative would be more beneficial than those identified in Alternative 1. With the performance-based terms and conditions associated with this alternative, modifications could be made to the grazing schedule to ensure standards are met and conditions are improved throughout the allotment, which in turn would be beneficial to the area's naturalness and values.

3.6.9.2.4 Alternative 4 Effects

LWCs are likely to improve with the proposed grazing system under this alternative. Overall the conditions of the area would improve due to the combination of a season-based alternative, fewer AUMs, and reduced livestock numbers. This would improve ecological health, visual quality, and naturalness throughout the area.

3.6.9.2.5 Alternative 5 Effects

The no-grazing alternative would provide the greatest amount of benefits to LWCs. There would be no effects to upland vegetation and riparian areas due to livestock grazing, thus improving the overall health, naturalness, and scenic quality throughout the area.

3.6.9.3 Cumulative Effects

Cumulative effects to LWCs within the Swisher Springs and Swisher FFR allotments would primarily be the result of grazing, and current and future actions that stem from OPLMA. The area of analysis for cumulative effects would consist of the inventoried units for the Swisher Allotment and Swisher FFR. The boundaries not only make up the entire allotment but extend into neighboring allotments such as Bull Basin, Castlehead-Lambert, and Nickel Creek. The timeframe considered is activities since OPLMA for current conditions and activities planned within the next 3 years, and the expected duration of effects from those activities (generally 10 to 20 years).

3.6.9.3.1 Alternatives 1 -5 Effects

Because there are no substantial effects expected from any of these alternatives, cumulative effects would be minimal for LWCs. Grazing activities throughout the analysis area would contribute in varying magnitudes toward cumulative effects by influencing plant species composition within the uplands as well as riparian areas, thus impacting the areas visual resources and naturalness to a greater or lesser degree. While these impacts may fluctuate within differing allotments, overall, considering the cumulative analysis area as a whole, these impacts are considered minimal and would not impair LWCs.

In the long term, the combined effects of suitable grazing management and travel management planning within the cumulative analysis area would be beneficial to LWCs and the overall ecological health, naturalness, and scenic quality of the area. There would be no long-term impairment of LWCs.

3.6.10 Economic and Social Values

3.6.10.1 Affected Environment

Swisher Springs Allotment

The Swisher Springs allotment includes 3,847 acres of public land, 4 acres of private land, and no state land (Table ALLOT-7) (Map RNGE-7). The allotment is located in Owyhee County, Idaho, approximately 55 miles south of Murphy, Idaho (Map GEN-1). Elevations on the allotment range from approximately 4,990 to 5,700 feet within the USDA Major Land Resource Area (MLRA) D-25-Owyhee High Plateau (USDA NRCS, 2006). Ecological sites described within the allotment are primarily Shallow Claypan sites dominated by low sagebrush (*Artemisia arbuscula*) and bunchgrasses or Loamy sites dominated by mountain big (*Artemisia tridentata* ssp. *vaseyana*) or Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and perennial bunchgrasses (USDA NRCS, 2003b). See Appendix G for a list of common and scientific names used within the document. The land forms in the allotment are mountains, foothills, and fan terraces, with slopes ranging from 2 to 30 percent.

Table ALLOT-7: Acreages (2012*) by pasture within the Swisher Springs allotment

Pasture	BLM Acreage	Private Acreage	Total Acreage
Pasture 1: Road Field	1,149	4	1,153
Pasture 2: Mountain Field	1,751	0	1,751
Pasture 3: Lower Allotment	947	0	947
Total	3,847	4	3,851

* Pasture and allotment acreage differ from data reported in the 2012 rangeland health assessment and evaluation report for the Swisher Springs allotment. Updated acreage is the product of improved GPS and GIS data.

The 1999 Owyhee Resource Management Plan (ORMP), the land use plan for Owyhee Field Office, categorized the Swisher Springs allotment as an improved (I) allotment with a low priority for management. Categorization of allotments in the land use plan prioritized development and implementation of grazing systems to meet multiple use resource objectives and/or rangeland health standards based on resource conditions, resource potentials, resource concerns, economics, present management, and other criteria.

In addition to allocating livestock grazing within the Swisher Springs allotment, the ORMP identified issues associated with livestock grazing with a listing of resource concerns and applicable ORMP resource objectives. Resource concerns identified included the ecological condition of vegetation communities, juniper encroachment, riparian-wetland ecosystems, and special status species (sage-grouse). Applicable ORMP management objectives identified included VEGE-1, RIPN-1, and SPSS-1[78].

The current total permitted use for livestock grazing in the Swisher Springs allotment is 514 AUMs, of which 322 AUMs are active and 192 AUMs are suspended (Table ALLOT-8).

Table ALLOT-8: Total permitted use for individual permittee in the Swisher Springs allotment

Permittee	Active Use	Suspension	Total
06 Livestock Company	345	192	537

The current grazing schedule was implemented with a final decision in 1989 prior to the adoption of the Idaho Standards and Guidelines for Rangeland Health. That decision implemented a 2-year rest/rotation grazing system for pastures 1 and 3. One of these two pastures is used between April 15 and July 15 in one year and is rested, no scheduled livestock grazing, in the second year. The other of these two pastures is rested in year one and used between April 15 and July 15 in the second year. Grazing use of pasture 2 is annually deferred until after the active growing season, which ends approximately July 1, and is authorized through October 31. The grazing schedule is summarized in Table ALLOT-9.

Table ALLOT-9: Swisher Springs allotment grazing schedule

	Year 1	Year 2
Pasture 1	April 15 to July 15	Rest
Pasture 2	July 15 to October 31	July 15 to October 31
Pasture 3	Rest	April 15 to July 15

Reported actual use and utilization levels recorded within pastures of the Swisher Springs allotment are summarized in Appendix B. These data identify that in recent years the grazing schedule has been implemented and that utilization levels have been less than the maximum allowable level of 50 percent set in livestock grazing management actions of the ORMP.

Swisher FFR Allotment

The Swisher Fenced Federal Range (FFR) allotment includes 141 acres of public land, 621 acres of private land, and no state land in one pasture (Map RNGE-7). The allotment is located in Owyhee County, Idaho, approximately 55 miles south of Murphy, Idaho. Elevations on the allotment range from approximately 4,920 to 5,200 feet within the USDA Major Land Resource Area (MLRA) D-25-Owyhee High Plateau (USDA NRCS, 2006). Ecological sites described for uplands within the allotment are primarily Shallow Claypan sites dominated by low sagebrush and perennial bunchgrasses (USDA NRCS, 2010). The land forms in the allotment include foothills and fan terraces adjacent to Castle Creek.

The 1999 ORMP, the land use plan for the Owyhee Field Office, categorized the Swisher FFR allotment as a custodial (C) allotment. Allotment categorization was based upon resource conditions, resource potentials, resource concerns, economics, present management and other criteria (USDI BLM, 1999a). Custodial category allotments receive the lowest priority for management attention.

[78] See section 1.7 of this EA for ORMP resource objectives or the ORMP (USDI BLM, 1999a).

In addition to allocating livestock grazing within the Swisher FFR allotment, the ORMP identified issues associated with livestock grazing with a listing of resource concerns and applicable ORMP resource objectives. Resource concerns identified included the ecological condition of vegetation communities, riparian-wetland ecosystems, and special status species (sage-grouse). Applicable ORMP management objectives identified included VEGE-1, RIPN-1, and SPSS-1[79].

The current total permitted use for livestock grazing in the Swisher FFR allotment is 15 AUMs from public lands, of which all AUMs are active (Table ALLOT-10).

Table ALLOT-10: Total permitted use for individual permittee in the Swisher FFR allotment

Permittee	Active Use	Suspension	Total
06 Livestock Company	15	0	15

3.6.10.2 Direct and Indirect Effects

Table SOCE-14 below shows the change in AUMs for each alternative on the Castlehead-Lambert allotment and the value of those changes. These values assume that the animals use all of the active use AUMs authorized. In the table, the net annual effect—which is equal to the dollar value of the change in total AUMs plus or minus the resulting difference in grazing fees—represents the market value of the change in AUMs for hypothetical livestock operations. It should not be construed as an estimate of the actual economic impact on actual individual ranches within the study area. Ranchers have a wide range of options available to them in terms of how they respond to changes in the permitted number of AUMs on their range allotment(s). Depending on the length of their allowed grazing season and the specific change in permitted AUMs, a rancher might choose to increase or decrease herd size, change grazing months, retain or sell animals at their headquarters, lease new ground or cancel one or more leases on private rangeland, switch to irrigated pasture, adjust feed lot contracts, completely change operation types, and so on. Given the number of uncertain variables and the range of possibilities, it is not feasible to anticipate how individual ranches will react to changes in their specific grazing permits. Also unknown are any and all associated business decisions made in response to prevailing markets, federal and state agricultural policies, and personal values.

BLM acknowledges that as a result of any changes in permitted AUMs, there are likely to be multiplier effects within the economy that serves the associated ranching community. Because it is not possible to quantify the specific monetary impacts on individual ranches, it is also not possible to accurately estimate the resulting multiplier effects. It is possible, however, to state qualitatively, for example, that a reduction in AUMs would result in a corresponding reduction in regional economic activity if ranches choose to reduce herd numbers and then in turn reduce their spending within the regional economy. The converse is also true (see this related discussion in Section 3.3.1.6 above).

[79] See section 1.7 of this EA for ORMP resource objectives or the ORMP (USDI BLM, 1999a).

Table SOCE-14: Value of change in AUMs for each alternative, based on 10-year market value*

Swisher Springs

Alternative	% Change in AUMs	Change in Total AUMs	Total AUMs in Alternative	Annual Dollar Value of Change	Net Annual Effect (Dollar Value of Change +/- Difference in Grazing Fees)
1 (Current Situation)	0%	0	322	$0	$0
2	7%	23	345	$291	$260
3	7%	23	345	$291	$260
4	-35%	-112	210	-$1,419	-$1,268
5 (No Grazing)	-100%	-322	0	-$4,080	-$3,645

Swisher FFR

Alternative	% Change in AUMs	Change in Total AUMs	Total AUMs in Alternative	Annual Dollar Value of Change	Net Annual Effect (Dollar Value of Change +/- Difference in Grazing Fees)
1 (Current Situation)	0%	0	15	$0	$0
2	0%	0	15	$0	$0
3	0%	0	15	$0	$0
4	0%	0	15	$0	$0
5 (No Grazing)	-100%	-15	0	-$190	-$170

*Ten-year Average Market Value of Forage per AUM in Idaho, 2002 - 2011 (non-irrigated private ground): $12.67

3.6.10.2.1 Alternative 1 Effects

Implementation of Alternative 1 for the Swisher Springs allotment would retain authorized levels of grazing use at the maximum level used by permittee in recent years, although reduce authorized levels by 7 percent from active use identified in the current permit. 06 Livestock Co. would have 23 fewerAUMs on the Swisher Springs allotment, but AUMs on the Swisher FFR allotment would remain the same. A total of 322 AUMs would be active and support grazing for 49 head of cattle from April 15 through October 31 annually, retaining support of ranch income at current levels. The grazing rotation among pastures would be unchanged, also not changing the complexity of livestock management practices or the terms of flexibility. Grazing use would be authorized in the three pastures of the allotment between 6.7 and 9.3 acres per AUM, utilizing upland forage resources between pastures relatively equally. This equitable division of use among pastures would retain a moderate level of grazing use within the allotment.

Implementation of Alternative 1 for the Swisher FFR allotment would retain authorized levels of grazing use at the levels identified in the current permit with terms and conditions unchanged. The permit would support ranch income at current levels. Grazing authorization in the Swisher FFR allotment with implementation of the alternatives 1 through 4 does not differ and therefore analysis of the consequences is the same in each of these alternatives.

The loss of AUMs on the Swisher Springs allotment combined with the active use AUM loss on the Castlehead-Lambert allotment represent 8 percent of the total previously permitted active use AUMs. However, because the AUMs proposed under Alternative 1 are the same as actual use reported in 2011, the operator is likely already managing livestock at these levels and paying the same amount for active use AUMs, so there would be little or no socioeconomic impact on the operation. In addition, grazing schedules would remain the same and thus have no socioeconomic impact on the operation. The ranch would continue contributing to employment and the purchase of goods and services. Under Alternative 1, the active use AUMs authorized would translate to an estimated $22,550 to the Owyhee County economy based on estimates from Darden et al (see Section 3.3.1.6 above).

3.6.10.2.2 Alternative 2 Effects

Implementation of the applicant's proposed action for the Swisher Springs allotment would increase levels of grazing use by 7 percent when compared to Alternative 1. A total of 345 AUMs would be active and support grazing for 53 head of cattle from May 15 through October 31 annually, increasing opportunity for higher livestock sales and ranch income when compared to Alternative 1. The grazing rotation between pastures would be unchanged, also not changing the complexity of livestock management practices or the terms of flexibility. Grazing use would be authorized in the three pastures of the allotment between 6.2 and 8.7 acres per AUM.

Grazing authorization in the Swisher FFR allotment with implementation of the alternatives 1 through 4 does not differ and therefore analysis of the consequences of implementing the applicant's proposed action are the same as those presented in Alternative 1.

Under Alternative 2, the number of AUMs and the grazing schedule would remain the same as under the current permit, so there would be no socioeconomic impacts to the ranch from this alternative. The ranch would continue contributing to employment and the purchase of goods and services. Under Alternative 2, the the active use AUMs authorized would translate to an estimated $23,000 to the Owyhee County economy based on estimates from Darden et al (see Section 3.3.1.6 above).

3.6.10.2.3 Alternative 3 Effects

Implementation of the performance-based alternative would increase authorized levels of grazing use by 7 percent compared to the levels authorized in Alternative 1, but retain authorized levels identified in current permit and the applicant's proposed action. A total of 345 AUMs would be active and support grazing for 53 head of cattle from May 15 through October 31 annually, retaining opportunity to support ranch income at current levels or greater than activated by permittees in recent years. The grazing rotation between pastures would be unchanged, although requirements for conformance with the performance criteria would change the complexity and intensity of livestock management practices. Grazing use would be authorized in the three pastures of the allotment between 6.2 and 8.7 acres per AUM initially.

As noted in the Effects Common to All Allotments section, the operators are given specific requirements for stubble height and vegetation utilization, and they will have flexibility in adjusting livestock numbers, as long as they stay within these sideboards. Due to this flexibility, it is not possible to provide an accurate analysis of the specific socioeconomic effects from Alternative 3. If the operators chose to purchase additional animals, 06 Livestock Co. would pay for the additional animals and additional active use AUMs. The operation would also need to purchase additional feed and pay for additional labor needed to manage the animals. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above.

However, as noted in the Effects Common to All Allotments section above, the operator might find that it is not possible to graze on the federal allotment for the entire length of the grazing season and still remain within the terms and conditions of the permit. In this case, the amount of forage available to permittees would be less than under Alternative 1 and, as a result, the economic contribution of grazing on this allotment would decline compared to Alternative 1. In order to maintain operations at the same level, operator(s) would need to identify alternative forage or feed. The costs for other grazing land and feed on the ranch are outlined in the Effects Common to All Allotments section above. If operators do not identify another source of forage or feed, operation levels might need to be reduced. With or without an alternative source of forage or feed, the overall economic contribution of the ranching operations to the regional economy may decline.

Grazing authorization in the Swisher FFR allotment with implementation of the alternatives 1 through 4 does not differ and therefore analysis of the consequences of implementing the performance-based alternative are the same as those presented in Alternative 1. Under Alternative 3, the active use AUMs authorized would translate to an estimated $23,000 to the Owyhee County economy based on estimates from Darden et al (see Section 3.3.1.6 above).

3.6.10.2.4 Alternative 4 Effects

Implementation of the season-based alternative would decrease levels of grazing in the Swisher Springs allotment use by 34 percent compared to Alternative 1 and by 39 percent compared to levels in the current grazing permits. 06 Livestock Co. would have 161fewer active use AUMs on the Swisher Springs allotment and 17 fewer cattle would be authorized compared to Alternative 1, but AUMs and cattle levels on the Swisher FFR allotment would remain at the previously permitted level. A total of 210 AUMs would be active and support grazing for 32 head of cattle from May 15 through October 31 annually, reducing opportunity for livestock sales and ranch income compared to Alternative 1. The grazing rotation would not require additional complexity of livestock moves since all pastures are adjacent to one another. Grazing use would be authorized in the three pastures of the allotment between 10.0 and 21.6 acres per AUM.

These actions are intended to address concerns regarding whether the allotments were meeting rangeland health standards and ORMP objectives. The active use AUMs lost on the Swisher Springs and Castlehead-Lambert allotments for this operator amount to 37 percent of the total previously permitted active use AUMs, which could be detrimental to the operation. Unless the operator could find an economically feasible option for feeding their livestock, they could make the decision to close completely. If this were the case, the socioeconomic impacts to the ranch would be the same as if the grazing permit were not renewed at all, as analyzed in Alternative 5 below.

Grazing authorization in the Swisher FFR allotment with implementation of the alternatives 1 through 4 does not differ and therefore analysis of the consequences of implementing the season-based alternative are the same as those presented in Alternative 1. Under Alternative 4, the active use AUMs authorized would translate to an estimated $14,000 to the Owyhee County economy based on estimates from Darden et al (see Section 3.3.1.6 above).

3.6.10.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would eliminate public land grazing within the Swisher Springs and Swisher FFR allotments for ten years, resulting in a disruption in current livestock management for the permittee utilizing forage production from the allotments in the annual plans. No permit would be offered with implementation of the no-grazing alternative and existing suspension AUMs would also not be carried forward. Because the operation uses public land forage to support cattle herds for approximately a portion of their year-round plans, limiting the operation to base property only or the permittee’s need to supplement forage production from alternate forage sources could result in significant reductions in herd size or additional planning and administration cost.

The decision not to renew the grazing permit for a period of 10 years likely would be detrimental to the operators associated with this allotment because they would probably not be able to graze their livestock elsewhere for the same cost in grazing fees that they currently pay and on-ranch feed costs could be substantial. The operators might choose to sell their livestock, equipment, and possibly their buildings and land. The socioeconomic impacts from closing this ranch are described in the Effects Common to All Allotments section above; the removal of the 337 AUMs that are authorized in Alternative 1 would be associated with more than $22,550 that this ranch would no longer contribute to the local economy, based on estimates from Darden et al (see Section 3.3.1.6 above)..

3.6.10.3 Cumulative Effects

The scope of this analysis covers Owyhee County, ID, Malheur County, OR, and Elko County, NV, because although the Owyhee Field Office has jurisdiction over just the allotments within the Owyhee Resource Area, the ranchers applying for livestock grazing permit renewals maintain base ranches near Jordan Valley, Oregon, and Tuscarora, Nevada. Actions taken regarding grazing permit renewals will affect the socioeconomic conditions in these counties because they influence decisions the operators make regarding their ranches. There are 135,116 active use AUMs permitted in Owyhee County (USDI BLM, 1999a), 407,473 active use AUMs permitted in the Malheur and Jordan Resource Areas in Oregon (USDI BLM, 2002a), and 305,247 AUMs in Elko County (USDI BLM, 1987). Based on estimates from Darden et al (see Section 3.3.1.6 above), which are for Owyhee County, Idaho, but are applied here to the entire three-county area, the total active use AUMs here contribute more than $56.7 million to the local economy.

For Alternatives 1-4, as long as the ranches remain in business, they will continue contributing to employment and the purchase and sale of goods and services in the local areas, and community cohesion will be maintained. For Alternative 5, not renewing the permits would mean that the BLM would no longer be contributing to the ranching community by providing grazing land, and if the ranches chose to close, the operators would no longer be contributing to employment or the purchase and sales of goods and services in the community but the U.S. government would continue contributing to the county through payments in lieu of taxes (PILT). Ranching plays a large role in all three counties, so although the loss of the 06 Livestock Co. ranch could have a substantial impact on the local communities, the loss, which is small in proportion to the total livestock operations' contributions to the three-county area, likely would not have a cumulative effect on a larger scale.

3.6.11 Cultural/Paleontological Resources

3.6.11.1 Affected Environment

To analyze the Swisher Springs and Swisher FFR allotments for cultural resource values, a Class I records search was conducted using Geographical Information System (GIS) datasets to verify recorded sites and survey acreage within the allotment. Each site record for Swisher FFR was reviewed for any comments relating to impacts and other information that would be helpful in this analysis. The inventory reports for Swisher Springs were examined to confirm the surveys' locations and their adherence to current standards. GIS data and aerial imagery were also checked for range improvements to identify areas where livestock may congregate and have the greatest potential to create disturbances. The results of the analysis are used to protect or mitigate impacts to cultural resources. If impacts to National Register of Historical Places (NRHP)-eligible properties are identified, the stipulations of the grazing permit can be modified to address the presence and protection of these resources. This process is in accordance with the grazing permit/lease renewal guidelines agreement between the BLM and the State Historic Preservation Office (SHPO) dated January 29, 1999, and with standard professional procedures for livestock grazing permit/lease renewals. If impacts to National Register of Historical Places (NRHP)-eligible properties are identified, the stipulations of the grazing permit can be modified to address the presence and protection of these resources.

The Swisher Springs allotment contains 3,851 acres of BLM-administered land. There have been two cultural resources surveys completed in the allotment, totaling 19 acres (less than 1 percent of public land), but there are no recorded cultural sites. Of the 12 range improvements reported on BLM land, five are potential livestock congregation areas. Surveys of these locations would determine if cultural resources are present and if there are any impacts that would need to be addressed.

Totaling 762 acres, private land constitutes the bulk of the Swisher FFR allotment, while land with BLM oversight comprises 141 acres spread along the periphery. Castle Creek runs through the middle of the allotment without crossing any public land. There have been no documented cultural resources surveys completed in the allotment, but there is one site record which credits an independent survey crew as authors. No inventory report exists on file at the BLM or at SHPO to describe the undertaking or to define the area investigated. The site is depicted as a small prehistoric location impacted by both livestock and a range project; however, there are no range improvement projects on record having occurred on public land within the allotment and none can be seen on aerial photographs of the site area. Although the site is listed not eligible for the NRHP, a monitoring visit would serve to update the site record and would determine the presence of any ongoing or new impacts.

Affected Environment – Paleontology
Both the Swisher Springs and the Swisher FFR allotments are positioned on the Glenns Ferry Formation. There are no recorded fossil sites in either of the allotments.

3.6.11.2 Direct and Indirect Effects

3.6.11.2.1 Alternatives 1-4 Effects

Alternative 1 would renew the grazing permit under the terms and conditions of the expiring permit. Stocking levels and seasons of use would remain the same and no range improvements or other projects are proposed. This alternative serves as the baseline for comparisons to the other alternatives.

<u>Swisher Springs</u>
There are no recorded sites within this allotment; therefore, no impacts would occur to known cultural properties.

<u>Swisher FFR</u>
There is one recorded site on public land within the allotment. The site record mentions grazing and range project impacts, but does not describe the nature and extent of those effects. Aerial photography taken in 2011 reveals no noticeable disturbance at or around the site area other than a possible livestock/wildlife trail and no evidence of a range improvement can be seen. Site monitoring and a record update would assess the true condition of any cultural resources at this location. Minor effects to the site from hoof mechanics may be expected, but no new or increased impacts or disturbances are predicted under this scenario.

3.6.11.2.2 Alternative 5 Effects

<u>Swisher Springs</u>
No grazing would occur under this alternative; therefore, there would be no impacts.

<u>Swisher FFR</u>
No grazing would occur under this alternative; therefore, there would be no impacts from grazing. The recorded site in the allotment would still be subject to weather, wildlife, fire, and other natural processes, but these types of impacts have been occurring since the sites were first formed and are generally minor in their overall effects. Artifact collecting and other human-caused disturbances would continue, but if ground cover increased from the lack of foraging and trampling, cultural material could be better hidden and protected.

3.6.11.3 Cumulative Effects

The scope of analysis for the Swisher Springs and Swisher FFR allotments is considered to be the allotment boundaries. The allotment is not part of an historic district under which sites could have a contributing element status and there are no recorded or known Traditional Cultural Properties within their boundaries. Any site that is eligible for the NRHP or is of an undetermined status is managed for preservation and protection.

3.6.11.3.1 Alternatives 1-4 Effects

Swisher Springs and Swisher FFR

There are no range improvements proposed under this alternative and there are no known undertakings planned for the general area that could affect cultural resources. For those reasons, cumulative impacts to cultural resources are not expected to occur under this alternative. Unforeseen impacts from unauthorized activities may occur, but cannot be predicted. The lone Swisher FFR cultural site that is reported to be in close proximity to an existing range improvement will be monitored for impacts and re-evaluated for NRHP status.

3.6.11.3.2 Alternative 5 Effects

Swisher Springs and Swisher FFR

Due to the absence of livestock and any proposed ground disturbing projects, cumulative impacts would not occur under this alternative. Sites within the allotments would be subjected to natural processes, as they have been since their formation, and any unanticipated human-caused disturbances.

4 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Consultation Date	Tribes, Individuals, Organizations, and/or Organizations
October 17, 2011	Group 1 (Owyhee River) Initial Scoping letters mailed to all Tribes, local and state agencies, affected grazing permittees, and other interested publics of record for the Owyhee River area allotments
November 9, 2011	BLM and Garat Allotment Grazing permittee – Petan Co of Nevada – YP Ranch, John Jackson (owner); also, range consultants Western Range Services, Quintin Barr
November 17, 2011	BLM and Castlehead-Lambert, Swisher Springs, and Swisher FFR allotments grazing permittees Dennis Stanford, 06 Livestock, and Rand Collins, Collins Family LLC; also, range consultant Chad Gibson.
Januray 19, 2012	BLM consultation with Shoshone-Paiute Tribes, Wings & Roots Program, Native American Campfire
January 23, 2012	BLM consultation with Owyhee County Commissioners in Murphy, Idaho
January 27, 2012	Issuance of Group 1 (Owyhee River) Scoping

Consultation Date	Tribes, Individuals, Organizations, and/or Organizations
	Package for 30-day public comment; scoping closed on February 29, 2012
February 9, 2012	Per the applicant's request, BLM and Garat allotment grazing permittee Petan Co. of Nevada – YP Ranch, John Jackson (owner); also range consultants Western Range Services, Quintin Barr
February 16, 2012	BLM consultation with Shoshone-Paiute Tribes, Wings & Roots Program, Native American Campfire
March 28, 2012	BLM meeting with Western Watersheds Project (WWP); In attendance from WWP: Katie Fite, Russ Hughins, and Ken Cole
July 16, 2012	BLM consultation with Owyhee County Commissioners in Murphy, Idaho
July 19, 2012	BLM consultation with Shoshone-Paiute Tribes, Wings & Roots Program, Native American Campfire
July 28, 2012	BLM presentation to the Owyhee Cattlemens' Association Meeting in Silver City, Idaho
July 22, 2012	BLM presentation at BLM/Congressional Staff Breakfast; in attendance from the Governor's Office: Steve Goodson.

5 EA AUTHORS

Name	Position
Jake Vialpando	Project Manager
Steve Christensen	Rangeland Management Specialist
Regina Rone	Soil Scientist
Susan Filkins	Biology Technician
Bonnie Claridge	Fisheries Biologist
Jason Sutter	Wildlife Biologist
Ryan Homan	Outdoor Recreation Planner
Brian McCabe	Archeologist
Jessica Gottlieb	Writer/Editor
Jayson Murgoitio	GIS Specialist

6 WORKS CITED

43 USC Chapter 8A. (1934). Subchapter 1, Section 315i - Disposition of moneys received; availability for improvements. *Taylor Grazing Act of 1934 (43 USC Chapter 8A - Grazing Lands)*. Retrieved from http://uscode.house.gov/download/pls/43C8A.txt

Aldridge, C. L., & Brigham, R. M. (2001). Nesting and reproductive activities of greater sage-grouse in a declining northern fringe population. *The Condor, 103*, 537-543.

Aldridge, C. L., & Brigham, R. M. (2002). Sage-grouse nesting and brood habitat use in southern Canada. *Journal of Wildlife Management, 66*(2), 433-444.

Allington, G. R., & Valone, T. J. (2011). Long-Term Livestock Exclusion in an Arid Grassland Alters Vegetation and Soil. *Rangeland Ecology & Management, 64*(4), 424-428. doi:http://dx.doi.org/10.2111/REM-D-10-00098.1

Anderson, D. C., Harper, K. T., & Holmgren, R. C. (1982). Factors influencing development of cryptogamic soil crusts in Utah deserts. *Journal of Range Management, 35*, 180-185.

Anderson, J. E., & Holt, K. E. (1981). Vegetation development over 25 years without grazing on sagebrush-dominated rangeland in southeastern Idaho. *Journal of Range Management, 34*(1), 25-29.

Anderson, L. D. (1991). *Bluebunch wheatgrass defoliation: Effects & recovery.* Salmon, Idaho: USDI BLM.

Ash, A., Thornton, P., Stokes, C., & Togtohyn, C. (2012). Is proactive adaptation to climate change necessary in grazed rangeland? *Rangeland Ecology and Management*, 65(6):563-568.

Atwood, D., & DeBolt, A. (2000). *Field Guide to the Special Status Plants of the Bureau of Land Management Lower Snake River District.* USDI BLM. Retrieved from http://www.blm.gov/pgdata/etc/medialib/blm/id/publications/field_guide_to_the.Par.60796.File.dat/part1.pdf

Baker, W. L. (2006). Fire and restoration of sagebrush ecosystems. *Wildlife Society Bulletin, 34*(1), 177-185. Retrieved from http://www.jstor.org/stable/3784952

Balch, J., Bradley, B., & D'Antonio, C. (2012). Introduced annual grass increases regional fire activity across the arid western USA (1980-2009). *Global Change Biology*, 1-11.

Bauer, A., Cole, C. V., & Black, A. L. (1987). Soil property comparisons in virgin grasslands between grazed and nongrazed management systems. *Soil Science Society of America Journal, 51*(1), 176-182. Retrieved from https://www.soils.org/publications/sssaj/abstracts/51/1/SS0510010176

Beck, J. L., & Mitchell, D. L. (2000). Influences of livestock grazing on sage-grouse habitat. *Wildlife Society Bulletin, 28*, 993-1002.

Beck, J. L., Connelly, J. W., & Wambolt, C. L. (2012). Consequences of treating Wyoming big sagebrush to enhance wildlife habitats. *Rangeland Ecology and Management, 65*(5), 444-455.

Bellows, B. C. (2003). *Managed Grazing in Riparian Areas.* Retrieved from National Sustainable Agriculture Information Service: https://attra.ncat.org/attra-pub/summaries/summary.php?pub=116

Belnap, J. (1993). Recovery rates of cryptobiotic crusts: inoculant use and assessment methods. *Great Basin Naturalist, 53*(1), 89-95. Retrieved from https://ojs.lib.byu.edu/ojs/index.php/wnan/article/viewArticle/370

Belnap, J., & Gardner, J. S. (1993). Soil microstructure in soils of the Colorado Plateau: the role of the cyanobacterium Microcoleus vaginatus. *Great Basin Naturalist, 53*(1), 40-47.

Belnap, J., & Gillette, D. A. (1998). Vulerability of desert soil surfaces to wind erosion: impacts of soil texture and disturbance. *Journal of Arid Environments, 39*, 133-142.

Belnap, J., Rosentreter, R., Leonard , S., Hilty Kaltenecker, J., Williams, J., & Eldridge, D. (2001). *Biological Soil Crusts: Ecology and Management.* Denver, Colorado: USDI BLM. Retrieved from http://www.blm.gov/nstc/library/pdf/CrustManual.pdf

Belsky, A. J., Matzke, A., & Uselman, S. (1999). Survey of livestock influences on stream and riparian ecosystems in the western United States. *Journal of Soil and Water Conservation, 54*, 419-431.

Bengeyfield, P., & Svoboda, D. (1998). Determining Allowable Use Levels for Livestock Movement in Riparian Areas. In D. F. Potts (Ed.), *Specialty Conference on Rangeland Management and Water Resources.* Reno, NV: American Water Resources Association. Retrieved from http://www.awra.org/proceedings/reno98/index.html

Beschta, R., Donahue, D., DellaSala, D., Rhodes, J., Karr, J., O'Brien, M., . . . Williams, C. D. (2012). Adapting to climate change on western public lands: Addressing the ecological effects of domestic, wild, and feral ungulates. *Environmental Management*, 1-18.

Blaisdell, J. B., & Pechanec, J. F. (1949). Effects of herbage removal at various dates on vigor of bluebunch wheatgrass and arrowleaf balsamroot. *Ecology,* 298-305.

Blank, R. R., & Morgan, T. (2012). Suppression of Bromus tectorum L. by established perennial grasses: Potential mechanisms - Part one. *Applied and Environmental Soil Science*. doi:10.1155/2012/632172

Bock, C. E., & Webb, B. (1984). Birds as grazing indicator species in southwestern Arizona. *Journal of Wildlife Management*, *48*, 1045-1049.

Bock, C. E., Saab, V. A., Rich, T. D., & Dobkin, D. S. (1993). Effects of livestock grazing on Neotropical migratory landbirds in western North America. In D. M. Finch, & P. W. Stangel (Eds.), *Status and Management of Neotropical Migratory Birds* (pp. 296-309). Fort Collins, CO: U.S. Forest Service Rocky Mountain Forest and Range Experiment Station.

Bogler, D. J. (2006). Pyrrocoma. In F. o. Committee (Ed.), *Flora of North America North of Mexico* (Vol. 20, pp. 413-424). Oxford University Press.

Bradley, B. (2009). Regional analysis of the impacts of climate change on cheatgrass invasion shows potential risk and opportunity. *Global Change Biology,* 15:196-208.

Braun, C. E. (2006). *A blueprint for sage-grouse conservation and recovery.* Tucson, Arizona: Grouse Inc.

Braun, C. E., Baker, M. F., Eng, R. L., Gashwiler, J. S., & Schroeder, M. H. (1976). Conservation Committee report on effects of alteration of sage-brush communities on the associated avifauna. *Wilson Bulletin*, *88*, 165-171.

Brennan, L. A., & Kuvlesky, Jr., W. P. (2005). North American grassland birds: an unfolding conservation crisis? *Journal of Wildlife Management*, *69*(1), 1-13.

Brewer, T. K., Mosley, J. C., Lucas, D. E., & Schmidt, L. R. (2007). Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland. *Rangeland Ecology and Management*, 60(5):498-507.

Briske, D. D., & Richards, J. H. (1994). Physiological responses of individual plants to grazing: current status and ecological significance. In M. Vavra, W. A. Laycock, & R. D. Pieper (Eds.), *Ecological Implications of Livestock Herbivory in the West* (pp. 147-176). Denver, Colo.: Society for Range Management.

Briske, D. D., Fuhlendorf, S. D., & Smeins, F. E. (2005). State-and-transition models, thresholds, and rangeland health: a synthesis of ecological concepts and perspectives. *Rangeland Ecology and Management*, 58(1): 1-10.

Broadhead, W. H. (1999). Cattle, Control, and Conservation. *CRM Online, 22*(9), 31-32. Retrieved May 21, 2012, from http://crm.cr.nps.gov/archive/22-9/22-09-12.pdf

Bryant, L. D. (1982). Response of livestock to riparian zone exclusion. *Journal of Range Management, 35*(6), 780-785.

Bull, E. L., & Hayes, M. P. (2000). Livestock effects on reproduction of the Columbia spotted frog. *Journal of Range Management, 53*, 291-294.

Bunting, S. C., Kilgore, B. M., & Bushey, C. L. (1987). *Guidelines for prescribed burning in sagebrush-grass rangelands in the Northern Great Basin.* Ogden, UT: USDA USFS Intermountain Research Station.

Bunting, S. C., Kingery, J. L., & Strand, E. (1997). Effects of Succession on Species Richness of the Western Juniper Woodland/Sagebrush Steppe Mosaic. *Proceedings: ecology and management of* *pinyon-juniper communities within the Interior West* (pp. 76-81). Provo, UT: USDA USFS. Retrieved from http://www.treesearch.fs.fed.us/pubs/33237

Bunting, S. C., Kingery, J. L., Hemstrom, M. A., Schroeder, M. A., Gravenmier, R. A., & Hann, W. J. (2002). *Altered rangeland ecosystems in the interior Columbia Basin.* Technical Report PNW-GTR-553, USDA USFS.

Burton, T. A., Smith, S. J., & Cowley, E. R. (2011). *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation.* Technical Reference 1737-23, Denver, CO.

Cagney, J. (1993). *Riparian Area Management: Greenline Riparian-Wetland Monitoring.* Technical Reference 1737-8, USDI BLM, Denver, CO.

Cagney, J., Bainter, E., Budd, B., Christiansen, T., Herren, V., Holloran, M., . . . Williams, J. (2010). *Grazing Influence, Objective Development, and Management in Wyoming's Greater Sage-Grouse Habitat, with emphasis on nesting and early brood rearing.* University of Wyoming , Cooperative Extension Service, Laramie, Wyoming.

Caro, T. M., & O'Doherty, G. (2001). On the use of surrogate species in conservation biology. *Conservation Biology, 13*(4), 805-814.

Chambers, J. C., Roundy, B. A., Blank, R. R., Meyer, S. E., & Whittaker, A. (2007). What makes Great Basin sagebrush ecosystems invasible by Bromus tectorum? *Ecological Monographs, 77*(1), 117-145. Retrieved from http://www.treesearch.fs.fed.us/pubs/27711

Chambers, J., & Pellant, M. (2008). Clikmate change impacts on northwestern and intermountain United States rangelands. *Rangelands*, 30(3):29-33.

Clary, W. P. (1995). Vegetation and soil responses to grazing simulation on riparian meadows. *Journal of Range Management, 48*(1), 18-25. Retrieved from http://www.jstor.org/stable/4002499

Clary, W. P. (1999). Stream channel and vegetation responses to late spring cattle grazing. *Journal or Range Management, 52*(3), 218-227. Retrieved from http://www.jstor.org/stable/4003683

Clary, W. P., & Webster, B. F. (1989). *Managing grazing of riparian areas in the Intermountain region.* General Technical Report INT-263, U.S. Forest Service, Intermountain Research Station, Ogden, Utah. Retrieved from http://www.fs.fed.us/rm/pubs_int/int_gtr263.pdf

Clary, W. P., Thornton, C. I., & Abt, S. R. (1996). Riparian stubble height and recovery of degraded stream banks. *Rangelands, 18*(4), 137-140. Retrieved from https://journals.uair.arizona.edu/index.php/rangelands/article/view/11297/10570

Clements, F. E. (1916). *Plant Succession; an analysis of the development of vegetation.* Washington D.C.: Carnegie Institution of Washington.

Coates, P. S., & Delehanty, D. J. (2010). Nest predation of greater sage-grouse in relation to microhabitat factors and predators. *Journal of Wildlife Management, 74*(2), 240-248.

Coates, P. S., Connelly, J. W., & Delehanty, D. J. (2008). Predators of greater sage-grouse nests identified by video monitoring. *Journal of Field Ornithology, 79*(4), 421-428.

Cole, D. N. (1990). Trampling disturbance and recovery of cryptogamic soil crusts in Grand Canyon National Park. *Great Basin Naturalist, 50*(4), 321-325. Retrieved from https://ojs.lib.byu.edu/ojs/index.php/wnan/article/viewArticle/214

Colket, B. (2006). *Slickspot Peppergrass (Lepidium papilliferum) Field Survey and Predictive Distribution Modeling.* Idaho Department of Fish and Game, Idaho Conservation Data Center, Boise, ID.

Connelly, J. W., & Braun, C. E. (1997). Long-term changes in sage grouse Centrocercus urophasianus populations in western North America. *Wildlife Biology, 3*, 229-234.

Connelly, J. W., Braun, C. E., Schroeder, M. A., & Hagen, C. A. (2007). Setting the record straight: a response to "Sage-Grouse at the Crossroads". *Rangelands, 29*(6), 35-39.

Connelly, J. W., Knick, S. T., Schroeder, M. A., & Stiver, S. J. (2004). *Conservation assessment of greater sage-grouse and sagebrush habitats.* Unpublished report, Western Association of Fish and Wildlife Agencies, Cheyenne, WY.

Connelly, J. W., Reese, K. R., & Schroeder, M. A. (2003). *Monitoring of greater sage-grouse habitats and populations.* University of Idaho, College of Natural Resources Experiment Station. Moscow, Idaho: University of Idaho.

Connelly, J. W., Rinkes, E. T., & Braun, C. E. (2011). Characteristics of Greater Sage-Grouse Habitats: A Landscape Species at Micro- and Macroscales. (S. T. Knick, & J. W. Connelly, Eds.) *Studies in Avian Biology, 38*, p. 78.

Connelly, J. W., Schroeder, M. A., Sands, A. R., & Braun, C. E. (2000). Guidelines to Manage Sage-grouse Populations and Their Habitats. *Wildlife Society Bulletin, 28*(4), 967-985.

Connelly, J. W., Wakkinen, W. L., Apa, A. D., & Reese, K. P. (1991). Sage grouse use of nest sites in southeastern Idaho. *Journal of Wildlife Management, 55*(3), 521-524.

Council on Environmental Quality. (1997). *Environmental Justice - Guidance Under the National Environmental Policy Act.* Retrieved from http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf

Crawford, J. A., Olson, R. A., West, N. E., Mosley, J. C., Schroeder, M. A., Whitson, T. D., . . . Boyd, C. S. (2004). Ecology and management of sage-grouse and sage-grouse habitat. *Journal of Range Management, 57*(1), 2-19.

Curtis, K. R., Brough, E., Torell, R., & Riggs, W. W. (2006). *Elko County Cow-Calf Production Costs & Returns, 2006.* Fact Sheet-07-08, University of Nevada Cooperative Extension. Retrieved from http://www.unce.unr.edu/publications/files/ag/2007/fs0708.pdf

Daddy, F., Trlica, M. J., & Bonham, C. D. (1988). Vegetation and soil water differences among big sagebrush communities with different grazing histories. *Southwestern Naturalist, 33*(4), 413-424.

Dadkhah, M., & Gifford, G. F. (1980). Influence of vegetation, rock cover, and trampling on infiltration rates and sediment production. *JAWRA Journal of the American Water Resources Association, 16*(6), 979-986. doi:doi: 10.1111/j.1752-1688.1980.tb02537.x

D'Antonio, C. M., & Vitousek, P. M. (1992). Biological invasions by exotic grasses, the grass/fire cycle, and global change. *Annual Review of Ecology and Systematics, 23*, 63-87. Retrieved from http://www.jstor.org/stable/2097282 .

Darden, T. D., Harris, T. R., Rimbey, N. R., & Harp , A. J. (1999). *Integrating Crop and Livestock Cost and Return Estimates into an Input-Output Model of Owyhee County, Idaho.* AEES No. 99-08, University of Idaho, College of Agricultural and Life Sciences, Caldwell, ID. Retrieved from http://www.cals.uidaho.edu/aers/PDF/AEES/1999/AEES9908.pdf

Davenport, D. W., Breshears, D. D., Wilcox, B. P., & Allen, C. D. (1998). Viewpoint: Sustainability of pinon-juniper ecosystems - a unifying perspective of soil erosion thresholds. *Journal of Range Management, 51*(2), 231-240.

Davies, K., Bates, J., Svejar, T., & Boyd, C. (2010). Effects of long-term livestock grazing on fuel characteristics in rangelands: An example from the sagebrush steppe. *Rangeland Ecology & Management, 63*(6), 662-669.

DeBano, L. F. (1981). *Water repellent soils: a state-of-the-art.* USFS. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station. Retrieved from http://www.fs.fed.us/psw/publications/documents/psw_gtr046/psw_gtr046.pdf

Deboodt, T. L., Fisher, M. P., Buckhouse, J. C., & Swanson, J. (2009). Monitoring hydrological changes related to western juniper removal: A paired watershed approach. In R. T. Webb, & D. J. Semmens (Ed.), *Proceedings on The Third Interagency Conference on Research in the Watersheds* (pp. 227-232). Estes Park, CO: USDI USGS.

DeLong, A. K., Crawford, J. A., & Delong, Jr., D. C. (1995). Relationaships between vegetational structure and predation of artificial sage grouse nests. *Journal of Wildlife Management, 59*(1), 88-92.

DeSante, D. F., & George, T. L. (1994). Population trends in the landbirds of western North America. In J. R. Jehl, & N. K. Johnson (Eds.), *A Century of Avifaunal Change in Western North America - Studies in Avian Biology No. 15* (pp. 173-190). Lawrence, KS: Cooper Ornithological Society.

Diamond, J., Call, C., & Devoe, N. (2009). Effects of targeted cattle grazing on fire behavior of cheatgrass-dominated rangeland in the northern Great Basin, USA. *International Journal of Wildland Fire, 18*(8), 944-950.
Dobkin, D. S. (1994). *Conservation and Management of Neotropical Migrant Landbirds in the Northern Rockies and Great Plains.* Moscow, ID: University of Idaho Press.
Dobkin, D. S. (1998). *Conservation and Management of Landbirds in the Great Basin.* Moscow, ID: University of Idaho Press.
Dobkin, D. S., & Sauder, J. D. (2004). *Shrubsteppe Landscapes in Jeopardy - Distributions, Abundances, and the Uncertain Future of Birds and Small Mammals in the Intermountain West.* Bend, OR: High Desert Ecological Research Institute. Retrieved from http://sagemap.wr.usgs.gov/Docs/shrubsteppe_landscapes.pdf
Dobkin, D. S., Rich, A. C., & Pyle, W. H. (1998). Habitat and avifaunal recovery from livestock grazing in a riparian meadow system of the northwestern Great Basin. *Conservation Biology, 12*(1), 209-221.
Driesner, D., & Coyner, A. (2011). *Major Mines of Nevada 2010: Mineral Industries in Nevada's Economy.* Special Publication P-22, Nevada Bureau of Mines and Geology, Nevada Division of Minerals, Carson City, NV. Retrieved from http://www.nbmg.unr.edu/dox/mm/mm10.pdf
Dyksterhuis, E. (1949). Condition and management of range land based on quantitative ecology. *Journal of Range Management*, 2:104-115.
Dyrness, C. T. (1976). *Effect of wildfire on soil wettability in the high Cascades of Oregon.* USFS. Portland, OR: Pacific Northwest Forest and Range Experiment Station.
Earnst, S. L., Ballard, J. A., & Dobkin, D. S. (2005). Riparian songbird abundance a decade after cattle removal on Hart Mountain and Sheldon National Wildlife Refuges. In C. J. Ralph, & T. Rich (Ed.), *Third International Partners in Flight Conference - General Technical Report PSW-GTR-191* (pp. 550-558). Albany, CA: U.S. Forest Service Pacific Southwest Research Station.
Earnst, S. L., Dobkin, D. S., & Ballard, J. A. (2012). Changes in avian and plant communities of aspen woodlands over 12 years after livestock removal in the northwestern Great Basin. *Conservation Biology, 26*(5), 862-872.
ECEDA. (2012). *http://www.eceda.com/*. Retrieved April 2012, from http://www.eceda.com/
Eldridge, S. (2004). *Soil management for dairy and beef cattle grazing.* Retrieved from New South Wales Agriculture: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/167028/soil-dairy-beef.pdf
Elmore, W. (1994). Riparian responses to grazing practices. In R. J. Naiman (Ed.), *Watershed Management: Balancing Sustainability and Environmental Change* (pp. 442-457). New York: Springer-Verlag.
Elmore, W., & Kauffman, B. (1994). Riparian and watershed systems: degradation and restoration. In M. Vavra, W. A. Laycock, & R. D. Pieper (Eds.), *Ecological implications of herbivory in the West* (pp. 212-231). Denver, Colorado: Society for Range Management.
EPS-HDT. (2012). *A Profile of Socioeconomic Measures.* Headwaters Economics.
Evans, R. A., & Young, J. A. (1970). Plant litter and establishment of alien annual weed species in rangeland communities. *Weed Science, 18*(6), 697-703. Retrieved from http://www.jstor.org/stable/4041635
Evans, R. D., & Ehleriger, J. R. (1993). A break in the nitrogen cycle in aridlands? Evidence from δ15N of Soils. *Oecologia, 94*(3), 314-317.
Facelli, J. M., & Pickett, S. T. (1991). Plant litter: its dynamics and effects on plant community structure. *The Botanical Review, 57*(1), 1-32. Retrieved from http://www.jstor.org/stable/4354158
Fertig, W., Black, R., & Wolken, P. (2005). *Rangewide Status Review of Ute Ladies'-Tresses (Piranthes diluvialis).* USFWS.
Fricke, K. A., Kempema, S. L., & Powell, L. A. (2009). Ecology of small mammals, vegetation, and avian nest survival on private rangelands in Nebraska. *Great Plains Research, 19*, 65-72.

Ganjegunte, G. K., Vance, G. F., Preston, C. M., Schuman, G. E., Ingram, L. J., Stahl, P. D., & Welker, J. M. (2005). Soil organic carbon composition in a northern mixed-grass prairie: Effects of grazing. *Soil Science Society of America Journal, 69*, 1746-1756. doi:10.2136/sssaj2005.0020

Ganskopp, D. (1988). Defoliation of Thurber needlegrass: herbage and root responses. *Journal of Range Management*, 41(6): 472-476.

Gardner, R., & Zelus, P. (2009). *Community Economic Profile: Owyhee County, Idaho.* Boise, ID.

Garton, E. O., Connelly, J. W., Horne, J. S., Hagen, C. A., Moser, A., & Schroeder, M. A. (2011). Greater sage-grouse population dynamics and probability of persistence. In S. T. Knick, & J. W. Connelley (Eds.), *Greater Sage-grouse: ecology and conservation of a landscape species and its habitats* (Vol. Studies in Avian Biology 38, pp. 293-381). Berkeley, California: University of California Press.

Gillen, R. L., Krueger, W. C., & Miller, R. F. (1984). Cattle distribution on mountain rangeland in northeastern Oregon. *Journal of Range Management, 37*(6), 549-553. doi:10.2307/3898856

Gray, C. W., Painter, K., & Rimbey, N. (2010). *2010 Idaho Livestock Costs and Returns Estimate.* EBB-CC3-10, University of Idaho Extension, Agricultural Economics and Rural Sociology. Retrieved from http://www.cals.uidaho.edu/aers/LivestockEBB2010/EBBCC310.pdf

Great Basin Restoration Initiative Workgroup. (2010). *Considerations for Strategically Reducing Fuels and Wildfire on Public Lands in the Great Basin with Targeted Grazing.* Boise, Idaho: Idaho State Office Bureau of Land Management.

Green, D. M., & Kauffman, J. B. (1995). Succession and livestock grazing in a northeastern Oregon riparian ecosystem. *Journal of Range Management, 48*(4), 307-313. Retrieved from http://www.jstor.org/stable/4002482

Gregg, M. A., Crawford, J. A., Drut, M. S., & DeLong, A. K. (1994). Vegetational cover and predation of sage grouse nests in Oregon. *Journal of Wildlife Management, 58*(1), 162-166.

Hagar, J., & Lienkaemper, G. (2007). *Pygmy rabbit surveys on state lands in Oregon.* Open-File Report 2007-1015, USDI USGS.

Hagen, C. A., Connelly, J. W., & Schroeder, M. A. (2007). A meta-anlaysis of greater sage-grouse Centrocercus urophasianus nesting and brood-rearing habitats. *Wildlife Biology, 13*(Supplement 1), 42-50.

Hagwood, S. (2006). *Field Guide to the Special Status Plants of the BLM Twin Falls District, Jarbidge Field Office Area.* Twin Falls, ID: USDI BLM. Retrieved from http://www.blm.gov/style/medialib/blm/id/reports/technical_bulletins/tb_06-1.Par.90597.File.dat/entiredoc.pdf

Hanes, R. C. (1988). *Lithic Assemblages of Dirty Shame Rockshelter, Changing Traditions in the Northern Intermontane.* Eugene, Oregon: Department of Anthropology, University of Oregon.

Hanser, S. E., & Knick, S. T. (2011). Greater sage-grouse as an umbrella species for shrubland passerine birds: a multiscale assessment. In S. T. Knick, & J. W. Connelley (Eds.), *Greater Sage-grouse: ecology and conservation of a landscape species and its habitats* (Vol. Studies in Avian Biology 38, pp. 475-487). Berkeley, California: University of California Press.

Harp, A. J., & Rimbey, N. R. (2004). *Cohesion, Integration and Attachment in Owyhee County Communities.* A. E. Extension Series No. 99-09, University of Idaho, Department of Agricultural Economics and Rural Sociology. Retrieved from http://www.cals.uidaho.edu/aers/PDF/AEES/1999/AEES99-09.pdf

Hausleitner, D., Reese, K. P., & Apa, A. D. (2005). Timing of vegetation sampling at greater sage-grouse nests. *Rangeland Ecology and Management, 58*(5), 553-556. Retrieved from http://www.jstor.org/stable/3899971

Hayward, B., Heske, E. J., & Painter, C. W. (1997). Effects of livestock grazing on small mammals at a desert cienaga. *Journal of Wildlife Management, 61*, 123-129.

Heltzel, J. M., & Earnst, S. A. (2006). Factors Influencing Nest Success of Songbirds in Aspen and Willow Riparian Areas in the Great Basin. *The Condor, 108*(4), 842-855.

Herrick, J. E., Van Zee, J. W., Havstad, K. M., Burkett, L. M., & Whitford, W. G. (2009). *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems, Volume 1: Quick Start.* USDA ARS - Jornada Experimental Range, Las Cruces, NM. Retrieved from http://californiarangeland.ucdavis.edu/Publications%20pdf/Quick_Start.pdf

Herrick, J. E., Whitford, W. G., de Soyza, A. G., Van Zee, J. W., Havstad, K. M., Seybold, C. A., & Walton, M. (2001). Field soil aggregate stability kit for soil quality and rangeland health evaluations. *Catena, 44*(1), 27-35. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0341816200001739

Hess, J. E., & Beck, J. L. (2012). Burning and mowing Wyoming big sagebrush: Do treated sites meet minimum guidelines for greater sage-grouse breeding habitats? *Wildlife Society Bulletin, 36*(1), 85-93.

Holechek, J. L. (1988). An approach for setting the stocking rate. *Rangelands, 10*(1), 10-14.

Holechek, J. L., Baker, T. T., Boren, J. C., & Galt, D. (2006). Grazing impacts on rangeland vegetation: What we have learned. *Rangelands, 28*(1), 7-13.

Holechek, J. L., De Souza Gomes, H., Molinar, F., & Galt, D. (1998). Grazing intensity: Critique and approach. *Rangelands, 20*(5), 15-18. Retrieved from http://www.jstor.org/stable/4001290

Holechek, J. L., Gomez, H., Molinar, F., & Galt, D. (1999). Grazing studies: What we've learned. *Rangelands, 21*(2), 12-16.

Holechek, J. L., Tembo, A., Daniel, A., Fusco, M. J., & Cardenas, M. (1994). Long-term grazing influences on Chihuahuan Desert rangeland. *The Southwestern Naturalist, 39*(4), 342-349. Retrieved from http://www.jstor.org/stable/30054369

Holechek, J. L., Thomas, M., Molinar, F., & Galt, D. (1999). Stocking desert rangelands: what we've learned. *Rangelands, 21*(6), 8-12.

Holloran, M. J., Heath, B. J., Lyon, A. G., Slater, S. J., Kuipers, J. L., & Anderson, S. H. (2005). Greater sage-grouse nesting habitat selection and success in Wyoming. *Journal of Wildlife Management, 69*(2), 638-649.

Huffman, D. W., Crouse, J. E., Chancellor, W. W., & Fulé, P. Z. (2012). Influence of time since fire on pinyon–juniper woodland structure. *Forest Ecology and Management, 274*, 29-37.

Huffman, E. L., MacDonald, L. H., & Stednick, J. D. (2001). Strength and persistence of fire-induced soil hydrophobicity under ponderosa and lodgepole pine, Colorado Front Range. *Hydrological Processes, 15*, 2877-2892. Retrieved from http://warnercnr.colostate.edu/~leemac/publications/StrengthandPersistanceofFire-inducedSoilHydrophobicityunderPonderosaandLodgepolePine.pdf

Huxman, T. E., Wilcox, B. P., Breshears, D. D., Scott, R. L., Snyder, K. A., Small, E. E., . . . Jackson, R. B. (2005). Ecohydrological implications of woody plant encroachment. *Ecology, 86*, 308-319.

Idaho DEQ. (2002). *Implementation plan for the North and Middle Fork of the Owyhee River.* Final implementation plan, Boise, Idaho. Retrieved from http://www.deq.idaho.gov/water/data_reports/surface_water/tmdls/owyhee_river_nf_mf/owyhee_river_nf_mf_implementation_plan.pdf

Idaho DEQ. (2005). *Principles and Policies for the 2002 Integrated (303(d)/305(b)) Report.* Boise, ID. Retrieved from http://www.deq.idaho.gov/media/458038-integrated_report_2002_final_entire.pdf

Idaho DEQ. (2009). *Upper Owyhee River TMDL Five-Year Review*. Boise, ID.

Idaho DEQ. (n.d.). *Table of Subbasin Assessments, TMDLs, Implementation Plans, and Five-Year Reviews*. Retrieved from http://www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls.aspx

Idaho Partners in Flight. (2000). *Idaho Bird Conservation Plan, Version 1.0.* Retrieved from http://www.blm.gov/wildlife/plan/pl_id_10.pdf

Idaho Sage-grouse Advisory Committee. (2006). *Conservation Plan for the Greater Sage-grouse in Idaho.* Boise, ID: IDFG. Retrieved from http://fishandgame.idaho.gov/public/wildlife/sageGrouse/conservPlan.pdf

Idaho Sage-grouse Advisory Committee. (2008). *Idaho sage-grouse local working groups annual report.* Boise, Idaho: Idaho Department of Fish and Game.

IDFG. (1992). Idaho's Migratory Landbirds: description, habitats and conservation. *Nongame Wildlife Leaflet #10*. (D. Ronayne, Ed.) Boise, Idaho: Idaho Department of Fish and Game. Retrieved from http://www.google.com/url?sa=t&rct=j&q=idaho's%20migratory%20landbirds&source=web&cd=1&ved=0CEcQFjAA&url=http%3A%2F%2Ffishandgame.idaho.gov%2Fpublic%2Fwildlife%2Fnongame%2FleafletLandbirds.pdf&ei=xaIqUIqREem9ywHRqoGwCQ&usg=AFQjCNFoDJHHTFb0ntKfFB2jvSqfESHA

IDFG. (2000a). *Project W-170-R-24 Elk Study I, Job 1*. Boise, Idaho.

IDFG. (2000b). *Project W-170-R-24 Mule Deer Study I, Job 2*. Boise, Idaho.

IDFG. (2004). *Project W-170-R-28 Pronghorn Study I, Job 7*. Boise, Idaho.

IDFG. (2006a). *Idaho Comprehensive Wildlife Conservation Strategy.* IDFG Idaho Natural Heritage Program, Boise, ID.

IDFG. (2006b). *Idaho Comprehensive Wildlife Conservation Strategy: Appendix F Species Accounts and Distribution Maps for Idaho Species of Greatest Concern.* Boise, ID: IDFG Idaho Natural Heritage Program. Retrieved November 17, 2011, from https://fishandgame.idaho.gov/ifwis/cwcs/appendixf.htm

IDFG. (2007). *Fisheries Management Plan 2007-2012.* Boise, ID.

IDFG. (2010). *Idaho Bighorn Sheep Management Plan 2010.* Boise, ID. Retrieved from http://fishandgame.idaho.gov/public/wildlife/planBighorn.pdf

IDFG. (2010a). *Project W-170-R-34 Elk Study 1, Job 1*. Boise, ID.

IDFG. (2010b). *Project W-170-R-34 Mule Deer Study I, Job 2*. Boise, ID.

IDFG. (2010c). *Project W-170-R-34 Pronghorn Study I, Job 7*. Boise, Idaho.

IDFG. (2011b). *Idaho Fish and Wildlife Information System*. Retrieved August 2011, from https://fishandgame.idaho.gov/ifwis/portal/

IPIF. (2000). *Idaho Bird Conservation Plan, Version 1.0.* Idaho Partners in Flight. Retrieved September 29, 2010, from http://www.partnersinflight.org/bcps/plan/pl_id_10.pdf

Johansen, J. R., & St. Clair, L. L. (1986). Cryptogamic soil crusts: recovery from grazing near Camp Floyd State Park, Utah, USA. *Great Basin Naturalist, 46*(4), 632-640.

Kaczor, N. W., Herman-Brunson, K. M., Jensen, K. C., Rumble, M. A., Klaver, R. W., & Swanson, C. C. (2011). Resource selection during brood-rearing by greater sage-grouse. In B. K. Sandercock, K. Martin, & G. Segelbacher (Eds.), *Ecology, conservation, and management of grouse* (Vol. Studies in Avian Biology 39, pp. 169-177). Berkeley, California: University of California Press.

Kauffman, J. B. (1982). *Synecological effects of cattle grazing riparian ecosystems.* MSc Thesis, Oregon State University, Corvallis, OR. Retrieved from http://hdl.handle.net/1957/13517

Kauffman, J. B., Krueger, W. C., & Vavra, M. (1984). *Ecology and plant communities of the riparian area associated with Catherine Creek in northeastern Oregon.* Agricultural Technical Bulletin 147, Oregon State University, Agricultural Experiment Station, Corvallis, OR. Retrieved from http://ir.library.oregonstate.edu/xmlui/handle/1957/8885

Knapp, P. (1996). Cheatgrass (Bromus tectorum L.) dominance in the Great Basin Desert: History, persistence and influence to human activities. *Global Environmental Change*, 6:37-52.

Knick, S. T., & Rotenberry, J. T. (1995). Landscape characteristics of fragmented shrubsteppe habitats and breeding passerine birds. *Conservation Biology, 5*, 1059-1071.

Knick, S. T., & Rotenberry, J. T. (2000). Ghosts of habitats past: Contribution of landscape change to current habitats used by shrubland birds. *Ecology, 81*, 220-227.

Knick, S. T., & Rotenberry, J. T. (2002). Effects of habitat fragmentation on passerine birds breeding in intermountain shrubsteppe. *Studies in Avian Biology, 25*, 130-140.

Knick, S. T., Dobkin, D. S., Rotenberry, J. T., Schroeder, M. A., Vander Haegen, W. M., & van Riper, III, C. (2003). Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. *The Condor, 105*, 611-634.

Knick, S. T., Holmes, A. L., & Miller, R. F. (2005). The role of fire in structuring sagebrush habitats and bird communities. *Studies in Avian Biology*, *30*, 63-75.

Knoll, G., & Hopkins, H. H. (1959). The effects of grazing and trampling upon certain soil properties. *Kansas Academy of Science, 62*(4), 221-231. Retrieved from http://www.jstor.org/stable/3626373

Knopf, F. L., Johnson, R. R., Rich, T., & Samson, F. B. (1988). Conservation of riparian ecosystems in the United States. *The Wilson Bulletin*, *100*, 272-284.

Krueper, D. J., Bart, J., & Rich, T. D. (2003). Response of vegetation and breeding birds to removal of cattle on the San Pedro River, Arizona (U.S.A.). *Conservation Biology, 17*, 607-615.

La Fayette, D. (2010). *Columbia spotted frog survey on private property, Owyhee County, Idaho.* Unpublished report prepared for USDI USFWS.

Lambeck, R. J. (1997). Focal Species: A Multi-Species Umbrella for Nature Conservation. *Conservation Biology*, *11*(4), 849-856.

Lamberti, G. A., Pearsons, T. N., Tait, C. K., Li, J. L., & Buckhouse, J. C. (1994). Cumulative effects of riparian disturbances along high desert trout streams of the John Day Basin, Oregon. *Transactions of the American Fisheries Society, 123*, 627-640.

Launchbaugh, K., & Walker, J. (2006). *Targeted Grazing-A New Paradigm for Livestock Management: in Targeted Grazing-A Natural Approach to Vegetation Management and Landscape Enhancement.* Englewood, Colorado: American Sheep Industry Association.

Laycock, W. A., & Conrad, P. W. (1967). Effect of grazing on soil compaction as measured by bulk density on a high elevation cattle range. *Journal of Range Management, 20*(3), 136-140. Retrieved from http://www.jstor.org/stable/3895792

Leonard, S. G., & Karl, M. G. (1995). *Livestock Grazing in Riparian areas in the interior Columbia Basin and portions of the Klamath and Great Basin.* Interior Columbia Basin Ecosystem Management Project. Retrieved from http://www.icbemp.gov/science/leonard4.pdf

Leonard, S., Kinch, G., Elsbernd, V., Borman, M., & Swanson, S. (1997). *Riparian Area Management: Grazing Management for Riparian-Wetland Areas.* Technical Reference 1737-14, USDI BLM, Denver, CO.

Lepage, M.-P., Bourdages, L., & Bourgeois, G. (2012). *Interpretation of Climate Change Scenarios in Order to Improve Agricultural Risk Management.* Quebec, Canada: Centre de reference en agriculture et agroalimentaire du Quebec.

Liggins, L. A. (1999). *Habitat use and behaviour of free range cattle on forested range in central B.C.* Vancouver, BC: The University of British Columbia. Retrieved from http://hdl.handle.net/2429/9344

Lodge, R. W. (1954). Effects of grazing on the soils and forage of mixed prairie in southwestern Saskatchewan. *Journal of Range Management*, *7*(4), 166-170. Retrieved from http://www.jstor.org/stable/3894448

Lohr, K. (2011). *Columbia Spotted Frog Great Basin Population Owyhee Subpopulation Long-term Monitoring Plan: Year 2011 Results.* IDFG, Nampa, ID.

Lohr, K., & Haak, B. (2009). *Columbia Spotted Frog Great Basin Population Owyhee Subpopulation Long-term Monitoring Plan: Year 2009 Results.* IDFG, Nampa, ID. Retrieved from http://idahodocs.cdmhost.com/cdm/singleitem/collection/p15100coll7/id/236376/rec/8

Lusby, G. C. (1963). Causes of variation in runoff and sediment yield from small drainage basins in western Colorado. *Proceedings of the Federal Inter-Agency Sedimentation Conference.* USDA.

Mack, R. N., & Thompson, J. N. (1982). Evolution in steppe with few large, hooved mammals. *The American Naturalist*, 119(6): 757-773.

Makela, P., & Major, D. (2012). *A framework to identify greater sage-grouse preliminary priority habitat and preliminary general habitat in Idaho.* White Paper, USDI BLM, Boise, ID. Retrieved from http://www.google.com/url?sa=t&rct=j&q=makela%20major%20sage-grouse%20preliminary%20priority%20habitat&source=web&cd=1&ved=0CD8QFjAA&url=http%3A%2F%2Fwww.blm.gov%2Fpgdata%2Fetc%2Fmedialib%2Fblm%2Fid%2Fwildlife%2Fsensitive_species%2Fsagegrouse_habitat.Parf

Malheur County, Ore. (2012). *About Malheur County*. Retrieved 2012, from http://www.malheurco.org/about

Mancuso, M. (2011). *Monitoring Davis' peppergrass (Lepidium davisii) on BLM Lands in Eastern Oregon and Southwestern Idaho, 2010 Results.* USDI BLM, Vale, OR.

Marble, J. R., & Harper, K. T. (1989). Effect of timing of grazing on soil-surface cryptogamic communities in a Great Basin low-shrub desert: a preliminary report. *Western North American Naturalist, 49*(1), 104-107.

Marlow, C. B., & Pogacnik, T. M. (1985). Time of grazing and cattle-induced damage to streambanks (General Technical Report RM-120). In R. R. Johnson, C. D. Ziebell, D. R. Patton, P. F. Folliott, & R. H. Hamre (technical coordinators) (Ed.), *1st North American Riparian Conference* (pp. 279-284). Tucson, AZ: USDA USFS.

McCalla, II, G. R., Blackburn, W. H., & Merrill, L. B. (1984a). Effects of livestock grazing on infiltration rates, Edwards Plateau of Texas. *Journal of Range Management, 37*(3), 265-269. Retrieved from http://www.jstor.org/stable/3899153

McCalla, II, G. R., Blackburn, W. H., & Merrill, L. B. (1984b). Effects of livestock grazing on sediment production, Edwards Plateau of Texas. *Journal of Range Management, 37*(4), 291-294. Retrieved from http://www.jstor.org/stable/3898696

McGrath, C. L., Woods, A. J., Omernik, J. M., Bryce, S. A., Edmondson, M., Nesser, J. A., . . . Plocher, M. D. (2002). Ecoregions of Idaho. Reston, Virginia: U.S. Geological Survey.

McInnis, M. L., & McIver, J. D. (2009). Timing of cattle grazing alters impacts on stream banks in an Oregon mountain watershed. *Journal of Soil and Water Conservation, 64*, 394-399.

Medin, D. E., & Clary, W. P. (1989). *Small mammal populations in a grazed and ungrazed riparian habitat in Nevada.* USDA USFS.

Meeuwig, R. O. (1970). *Sheet erosion on intermountain summer ranges.* Ogden, UT: USDA USFS Intermountain Forest and Range Experiment Station .

Meeuwig, R. O. (1971). *Infiltration and water repellency in granitic soils.* Ogden, UT: USDA USFS Intermountain Forest & Range Experiment Station.

Meyer, S. E., Quinney, D., & Weaver, J. (2005). A Life History Study of the Snake River Plains Endemic Lepidium papilliferum (Brassicaceae). *Western North American Naturalist, 65*, 11-23.

Miller, R. F., & Eddleman, L. L. (2001). *Spacial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome.* Technical Bulletin 151, Oregon State University, Agricultural Experiment Station , Corvallis, Oregon.

Miller, R. F., Bates, J. D., Svejcar, T. J., Pierson, F. B., & Eddleman, L. E. (2005). *Biology, ecology, and management of western juniper.* Oregon State University Agricultural Experiment Station Technical Bulletin 152. Retrieved from http://juniper.oregonstate.edu/bibliography/article.php?article_id=53

Miller, R. F., Seufert, J. M., & Haferkamp, M. R. (1994). *Management of bluebunch wheatgrass (Agropyron spicatum): A review.* Station Bulletin 669, Oregon State University , Agricultural Experiment Station, Corvallis, Oregon.

Mills, L. S. (2007). Bridging applied population and ecosystem ecology with focal species concepts. In *Conservation of wildlife populations* (pp. 276-285). Oxford, United Kingdom: Blackwell Publishing.

Mosconi, S. L., & Hutto, R. L. (1982). The effect of grazing on land birds of a western Montana riparian habitat. In J. M. Peek, & P. D. Dalke (Ed.), *Wildlife-Livestock Relationships Symposium: Proceedings 10.* Moscow, ID. Retrieved from http://dbs.umt.edu/research_labs/huttolab/PDF/publications/1982-Mosconi&Hutto-UI-grazing.pdf

Moynahan, B. J., Lindberg, M. S., Rotella, J. J., & Thomas, J. W. (2007). Factors affecting nest survival of greater sage-grouse in northcentral Montana. *Journal of Wildlife Management, 71*(6), 1773-1783.

MSU Environmental Statistics Group. (2012). *Graphical Locater Home Page*. Retrieved March 22, 2012, from http://www.esg.montana.edu/gl/

Mueggler, W. F. (1972). Influence of competition on the response of bluebunch wheatgrass to clipping. *Journal of Range Management, 25*(2), 88-92.

Mueggler, W. F. (1975). Rate and pattern of vigor recovery in Idaho fescue and bluebunch wheatgrass. *Journal of Range Management, 3*, 198-204.

Mueggler, W. F., & Stewart, W. L. (1980). *Grassland and Shrubland Habitat Types of Western Montana.* USDA Forest Service Intermountain Research Station General Technical Report INT-66.

Muhlfeld, C. C., & Bennett, D. H. (2001). Summer habitat use by Columbia River redband trout in the Kootenai River drainage, Montana. *North American Journal of Fisheries Management, 21*, 223-235.

Mule Deer Working Group. (2004). *North American Mule Deer Conservation Plan.* Western Association of Fish and Game Agencies. Retrieved from http://fishandgame.idaho.gov/public/wildlife/muleDeerInitiative/planWAFWA.pdf

Munger, J., Ames, A., & Barnett, B. (1997). *Surey for Columbia spotted frogs in the Owyhee Mountains of southwestern Idaho.* Technical Bulletin 97-13, USDI BLM, Boise, ID.

Munger, J., Heberger, L., Logan, D., Peterson, W., Mealy, L., & Cauglin, M. (1994). *A survey of the herpetofauna of the Bruneau Resource Area, with focus on the spotted frog, Rana pretiosa.* Technical Bulletin 94-7, USDI BLM, Boise, ID.

Musil, D. D. (2011). Use of Dwarf Sagebrush by Nesting Greater Sage-grouse. (B. K. Sandercock, K. Martin, & G. Segelbacher, Eds.) *Studies of Avian Biology, 30*(Ecology, Conservation, and Management of Grouse), pp. 119-136.

NABCI-US. (2000). *Bird Conservation Regions*. Retrieved May 15, 2012, from North American Bird Conservation Initiative - United States: http://www.nabci-us.org/bcrs.htm

National Research Council. (1994). *Rangeland Health: New Methods to Classify, Inventory, and Monitor Rangelands.* Washington D.C.: National Academy Press.

NatureServe. (n.d.). *Natural Heritage Methodology.* procedures for identifying, inventorying, and mapping species and ecosystems of conservation concern. Retrieved from http://www.natureserve.org/prodServices/heritagemethodology.jsp

Neilson, R., Lenihan, J., Bachelet, D., & Drapek, R. (2005). Climate change implications for sagebrush ecosystems. *Transactions of the 70th North American Wildlife and Natural Resources Conference*, (pp. 145-159). Fort Collins, Colorado.

Nelle, P. J., Reese, K. P., & Connelly, J. W. (2000). Long-term effects of fire on sage-grouse habitat. *Journal of Rangeland Management, 53*(6), 586-591.

Omernik, J. M. (1995). Ecoregions - a framework for environmental management. In W. S. Davis, & T. P. Simon (Eds.), *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making* (pp. 49-62). Boca Raton, FL: Lewis Publishers.

Omernik, J. M. (2004). Perspectives on the nature and definition of ecological regions. *Environmental Management, 34*(Supplement 1), s27-s38. doi:10.1007/s00267-003-5197-2

Oregon State University. (2011). *Wildlife Viewer*. Retrieved December 28, 2011, from Oregon Explorer Natural Resources Digital Library: http://oe.oregonexplorer.info/Wildlife/wildlifeviewer/

Oregon State University Agricultural Experiment Station. (2005). *Biology, Ecology, and Management of Western Juniper.* Corvallis, Oregon: Oregon State University.

Oregon Watershed Enhancement Board. (2007). *Western Juniper Management: A Field Guide.* Oregon: Oregon Watershed Enhancement Board.

OSU Extension Service. (1997). *350 Cow/Calf, High Desert Area Enterprise Budget.* EM 8470. Retrieved from http://arec.oregonstate.edu/oaeb/files/pdf/EM8470.pdf

Owyhee Columbia Spotted Frog Working Group. (2007). *Columbia spotted frog Great Basin population (Owyhee subpopulation) long-term monitoring plan: Revised 2007.* IDFG.

Owyhee County Commissioners. (2009). *Owyhee County Natural Resources Plan.* Murphy, ID.

Packer, P. E. (1963). Soil stability requirements for the Gallatin elk winter range. *Journal of Wildlife Management, 27*(3), 401-410. Retrieved from http://www.jstor.org/stable/3798513

Paige, C., & Ritter, S. A. (1999). *Birds in a sagebrush sea: Managing sagebrush habitats for bird communities.* Boise, ID: Partners in Flight Western Working Group.

Pellant, M. (1996). *Cheatgrass: The Invader that Won the West.* White paper, Interior Columbia Basin Ecosystem Management Project, USDI BLM, Boise, ID. Retrieved from http://www.icbemp.gov/science/pellant.pdf

Perkins, J. M., & Peterson, J. R. (1997). *Bat distribution in the juniper woodlands of the Idaho Owyhee Mountains.* Technical Bulletin No. 94, USDI BLM.

Perryman, B. L., Olson, R. A., Petersburg, S., & Naumann, T. (2002). Vegetation response to prescribed fire in Dinosaur National Monument. *Western North American Naturalist, 62*(4), 414-422.

Petan Co. of Nevada. (2007). Comments regarding the final Garat Allotment Rangeland Health Asssessment/Evaluation and Determination and the forthcoming Draft Environmental Assessment and Garat Term Permit Renewal. 328 pp. Tuscarora, NV: YP Ranch.

Pierson, F. B., Bates, J. D., Svejcar, T. J., & Hardegree, S. P. (2007). Runoff and erosion after cutting western juniper. *Rangeland Ecology and Management, 60*(3), 285-292. Retrieved from http://naldc.nal.usda.gov/download/14719/PDF

Platts, W. S. (1982). Livestock and Riparian-Fishery Interactions: What Are the Facts? In K. Sabol (Ed.), *Transactions of the 47th North American Wildlife and Natural Resources Conference*, (pp. 507-515). Washington, DC. Retrieved from http://digitalcommons.unl.edu/usdafsfacpub/76

Plew, M. G. (2008). *The Archaeology of the Snake River Plain, Second Edition.* Boise, Idaho: Department of Anthropology, Boise State University.

Pluhar, J. J., Knight, R. W., & Heitschmidt, R. K. (1987). Infiltration rates and sediment production as influenced by grazing systems in the Texas rolling plains. *Journal of Range Management, 40*(3), 240-243. Retrieved from http://www.jstor.org/stable/3899087

Powell, G. W., Cameron, K. J., & Newman, R. F. (2000). *Analysis of Livestock Use of Riparian Areas: Literature Review and Research Needs Assessment for British Columbia.* Victoria, BC: B.C. Ministry of Forests. Retrieved from http://www.for.gov.bc.ca/hfd/pubs/docs/wp/wp52.htm

Powers, R. F., Alban, D. H., Miller, R. E., Tiarks, A. E., Wells, C. G., Avers, P. E., . . . Loftus, Jr., N. S. (1990). Sustaining Site Productivity in North American Forests: Problems and Prospects. In S. P. Gessel, D. S. Lacate, G. F. Weetman, & R. F. Powers (Ed.), *Sustained Productivity of Forest Soils: Proceedings of the 7th North American Forest Soils Conference* (pp. 49-79). Vancouver, B.C., Canada: Faculty of Forestry, University of British Columbia.

President William J. Clinton. (2001, January 10). Executive Order 13186 -- Responsibilities of Federal Agencies To Protect Migratory Birds. Washington, DC. Retrieved from http://ceq.hss.doe.gov/nepa/regs/eos/eo13186.html

Prichard, D., Bridges, C., Krapf, R., Leonard, S., & Hagenbuck, W. (1998). *Riparian Area Management: Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas.* Technical Reference 1737-11, Denver, CO.

Quinney, D. (1999). Then and Now: Changes in vegetation and land use practices in southwestern Idaho sagebrush lands, with emphasis on sagebrush and former sagebrush lands of the Snake River Birds of Prey National Conservation Area north of the Snake River. In P. G. Entwistle, A. M. DeBolt, J. H. Kaltenecker, & K. Steenhof (Ed.), *Proceedings: Sagebrush Steppe Ecosystem Symposium* (pp. 91-97). Boise, ID: USDI BLM.

Reaser, J. K. (1996). Spotted frog: catalyst for sharing common ground in the riparian ecosystems of Nevada's range landscape. In K. E. Evans (Ed.), *Sharing common ground on western rangelands: proceedings of a livestock/big game symposium* (pp. 32-39). Ogden, Utah: USDA USFS Intermountain Research Station.

Reed, F., Roath, R., & Bradford, D. (1999). The grazing response index: a simple and effective method to evaluate grazing impacts. *Rangelands, 21*(4), 3-6.

Reed, M. J., & Peterson, R. A. (1961). *Vegetation, soil, and cattle responses to grazing on northern Great Plains Range.* USDA.
Reinkensmeyer, D. P., Miller, R. F., Anthony, R. G., & Marr, V. E. (2007). Avian community structure along a mountain big sagebrush successional gradient. *Journal of Wildlife Management, 71*, 1057-1066.
Rhoades, E. D., Locke, L. F., Taylor, H. M., & McIlvain, E. H. (1964). Water intake on a sandy range as affected by 20 years of differential cattle stocking rates. *Journal of Range Management, 17*(4), 185-190. Retrieved from http://www.jstor.org/stable/3895762
Ring, M., Lindner, D., Cross, E., & Schlesinger, M. (2012). Causes of the global warming observed since the 19th century. *Atmospheric and Climate Sciences*, 2:401-415.
Riparian Habitat Joint Venture. (2004). *The riparian bird conservation plan: A strategy for reversing the decline of riparian-associated birds in California, Version 2.0.* California Partners in Flight.
Robertson, J. H. (1971). Changes on a sagebrush-grass range in Nevada ungrazed for 30 years. *Journal of Range Management, 24*(5), 397-400. Retrieved from http://www.jstor.org/stable/3896614
Roche, L. M. (2003). A Review of Livestock Impacts on Riparian Ecosystems: Vegetative and Aquatic Consequences and Grazing Management. (K. Waltonen, Ed.) *Prized Writing: The Essay and Scientific & Technical Writing*(2002-2003).
Rosentreter, R. (1994). Displacement of Rare Plants by Exotic Grasses. *Proceedings of the Symposium on Ecology, Management and Restoration of Intermountain Rangelands*, (pp. 170-175). Monsen, SD.
Rowland, M. M., Suring, L. H., Tausch, R. J., Greer, S., & Wisdom, M. J. (2008). *Characteristics of western juniper encroachment into sagebrush communities in central Oregon.* Forestry and Range Sciences Laboratory, United States Department of Agriculture. La Grande, Oregon: Forest Service.
Rowland, M. M., Wisdom, M. J., Suring, L. H., & Meinke, C. W. (2006). Greater sage-grouse as an umbrella species for sagebrush-associated vertebrates. *Biological Conservation, 129*, 323-335.
Sands, A., & Smurthwaite, D. (1992). *Upland Game Bird Habitat Management - On the Rise.* USDI BLM. Retrieved from ftp://ftp.blm.gov/pub/blmlibrary/BLMpublications/StrategicPlans/Wildlife/UplandGameBird.pdf
Sather-Blair, S., Makela, P., Carrigan, T., & Anderson, L. (2000). *A Framework to Assist in Making Sensitive Species Habitat Assessments for BLM-Administered Public Lands in Idaho - Sage-grouse.* USDI BLM, Boise, ID. Retrieved from http://ndow.org/wild/conservation/sg/plan/SGPlan063004_E.pdf
Schlesinger, W. H., Raikes, A. J., Hartley, A. E., & Cross, A. F. (1996). On the spatial pattern of soil nutrients in desert ecosystems. *Ecology, 77*(2), 364-374. Retrieved from http://www.jstor.org/stable/2265615
Schroeder, M. A., Aldridge, C. L., Apa, A. D., Bohne, J. R., Braun, C. E., Bunnel, S. D., . . . Stiver, S. J. (2004). Ditribution of sage-grouse in North America. *The Condor, 106*, 363-376.
Schroeder, M. A., Young, J. R., & Braun, C. E. (1999). Sage grouse (Centrocercus urophasianus). In A. Poole, & F. Gill (Eds.), *The Birds of North America* (Vol. 425, pp. 1-28). Philadelphia, Pennsylvania: The Birds of North America.
Schulz, T. T., & Leininger, W. C. (1990). Nongame wildlife communities in grazed and ungrazed montane riparian sites. *Great Basin Naturalist, 51*, 286-292.
Schuman, G. E., Reeder, J. D., Manley, J. T., Hart, R. H., & Manley, W. A. (1999). Impact of grazing management on the carbon and nitrogen balance of a mixed-grass rangeland. *Ecological Applications, 9*, 65-71. doi:http://dx.doi.org/10.1890/1051-0761(1999)009[0065:IOGMOT]2.0.CO;2
Scrimgeour, G. J., & Kendall, S. (2002). Consequences of livestock grazing on water quality and benthic algal biomass in a Canadian natural grassland plateau. *Environmental Management, 29*(6), 824-844.

Siegel Thines, N. J., Shipley, L. A., & Sayler, R. D. (2004). Effect of cattle grazing on ecology and habitat of Columbia Basin pygmy rabbit (Brachylagus idahoensis). *Biological Conservation, 119*, 525-534.
Smith, M. A., Rodgers, J. D., Dodd, J. L., & Skinner, Q. D. (1992). Habitat selection by cattle along an ephemeral channel. *Journal of Range Management, 45*(4), 385-390.
Staudinger, M., Grimm, N., Staudt, A., Carter, S., Chapin III, F., Kareiva, P., . . . Stein, B. (2012). *Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services: Technical Input to the 2013 National Climate Assessment.* Cooperative Report to the 2013 National Climate Assessment 296 p.: Available at: http://assessment.globalchange.gov.
Steenhof, K., Kochert, M. N., & McDonald, T. L. (1997). Interactive effects of prey and weather on golden eagle reproduction. *Journal of Animal Ecology, 66*, 350-362.
Stevens, R., McArthur, E. D., & Davis, J. N. (1992). *Reevaluation of vegetative cover changes, erosion, and sedimentation on two watersheds - 1912-1983.* USDA USFS Intermountain Research Station.
Stewart, G., & Hull, A. C. (1949). Cheatgrass (Bromus tectorum L.) - an ecologic intruder in southern Idaho. *Ecology, 30*(1), 58-74. Retrieved from http://www.jstor.org/stable/1932277
Stewart, K. M., Bowyer, R. T., Kie, J. G., Cimon, N. J., & Johnson, B. K. (2002). Temporospatial distributions of elk, mule deer, and cattle: resource partitioning and competitive displacement. *Journal of Mammalogy, 83*, 229-244.
Stiver, S. J., Apa, A. D., Bohne, J. R., Bunnell, S. D., Deibert, P. A., Gardner, S. C., . . . Schroeder, M. A. (2006). *Greater sage-grouse comprehensive conservation strategy.* Unpublished Report, Western Association of Fish and Wildlife Agencies, Cheyenne, WY.
Stiver, S. J., Rinkes, E. T., & Naugle, D. E. (2010). *Sage-grouse Habitat Assessment Framework - Multi-scale Habitat Assessment Tool.* Unpublished Report, USDI BLM, Boise, ID.
Stoddart, L. A. (1946). *Some physical and chemical responses of Agropyron spicatum to herbage removal at various seasons.* Logan, Utah: Utah State Agricultural Experiment Station Bulletin #324.
Stohlgren, T., Binkley, D., Chong, G., & Kalkhan, M. (1999). Exotic Plant Species Invade Hot Spots of Native Plant Diversity. *Ecological Monographs, 69*(1), 25-46. Retrieved 2012
Sutter, J. A. (2011, December 12). Notification of Incidental Sage-grouse Sightings. *Email from Arthur Talsma (The Nature Conservancy)*. Boise, ID.
Tait, C. K., Li, J. L., Lamberti, G. A., Pearsons, T. N., & Li, H. W. (1994). Relationships between riparian cover and the community structure of high desert streams. *Journal of North American Benthological Society, 13*(1), 45-56.
Taylor, D. M. (1986). Effects of cattle grazing on passerine birds nesting in riparian habitat. *Journal of Range Management, 39*, 254-285.
Taylor, D. M., & Littlefield, C. D. (1986). Willow flycatcher and yellow warbler response to cattle grazing. *American Birds, 40*(5), 1169-1173.
Taylor, F. R., Gillman, L. A., & Pendretti, J. W. (1989). Impact of cattle on two isolated fish populations in Pahranagat Valley, Nevada. *Great Basin Naturalist, 49*(4), 491-495. Retrieved from https://ojs.lib.byu.edu/ojs/index.php/wnan/article/viewArticle/1692
Taylor, Jr., C. A. (2006). *Targeted Grazing to Manage Fire Risk: in Targeted Grazing: A Natural Approach to Vegetation Management and Landscape Enhancement.* Englewood, Colorado: American Sheep Industry Association.
Thacker, E. T. (2010). *Greater sage-grouse seasonal ecology and responses to habitat manipulations in northern Utah.* Logan, UT: Utah State University. Retrieved from http://digitalcommons.usu.edu/etd/707/
The State of Idaho. (2012). *Federal Alternative of Governor C.L. "Butch" Otter for Greater Sage-grouse Management in Idaho.* Boise, ID. Retrieved from http://fishandgame.idaho.gov/public/wildlife/SGtaskForce/alternative.pdf
Thompson, J. R. (1968). Effect of grazing on infiltration in a western watershed. *Journal of Soil and Water Conservation, 23*, 63-65.

Thurow, R. F., Lee, D. C., & Rieman, B. E. (1997). Distribution and status of seven native salmonids in the Interior Columbia River Basin and portions of the Klamath River and Great Basins. *North American Journal of Fisheries Management, 17*(4), 1094-1110.

Thurow, T. L., Blackburn, W. H., & Taylor, Jr., C. A. (1986). Hydrologic characteristics of vegetation types as affected by livestock grazing systems, Edwards Plateau, Texas. *Journal of Range Management, 39*(6), 505-509. Retrieved from http://www.jstor.org/stable/3898758

Tuason, T. (2005). *Boise District BLM Lepidium Davisii Monitoring Results from the Mountain Home Desert.* Boise: Bureau of Land Management.

Turner, R. M. (1990). Long-term vegetation change at a fully protected Sonoran Desert site. *Ecology, 71*(2), 464-477.

U.S. Army. (1990). *Impacts of Domestic Livestock Grazing on Archeological Resources.* Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

U.S. Census Bureau. (2011, February). *2010 U.S. Census*. Retrieved April 2012, from http://2010.census.gov/2010census/

U.S. Census Bureau. (2012, Last updated April 20). *American Community Survey*. Retrieved April 2012, from http://www.census.gov/acs/www/

University of Idaho. (2011). *Idaho Vertebrate Modeling Database*. Retrieved November 17, 2011, from Landscape Dynamics Lab, Idaho Cooperative Fish and Wildlife Research Unit: http://www.wildlife.uidaho.edu/idvmd/index.asp

University of Idaho. (2011a). *Fuel Treatments on Rangelands.* Report No. 32, University of Idaho Policy Analysis Group, College of Natural Resources, Moscow, Idaho.

University of Nevada Cooperative Extension. (2007). *Northeastern Nevada Wildfires 2006 Part 2 - Can livestock grazing be used to reduce wildfires? (Fact sheet-07-21).* Reno, Nevada.

US GAO. (1988). *Public rangelands: some riparian areas restored but widespread improvement will be slow.* GAO/RCED-88-105, Gaithersburg, MD.

USDA FSA. (2011, Last modified: August 18). *National Agriculture Imagery Program (NAIP).* Retrieved from http://www.fsa.usda.gov/FSA/apfoapp?area=home&subject=prog&topic=nai

USDA NASS. (2009). *2007 Census of Agriculture.* Retrieved from http://www.agcensus.usda.gov/Publications/2007/Full_Report/Census_by_State/

USDA NASS. (2011). *2011 Idaho Agricultural Statistics.* Boise, ID.

USDA NASS. (2012). *Grazing Fees: Animal Unit Fee, 17 States*. Retrieved 04 26, 2012, from Charts and Maps: http://www.nass.usda.gov/Charts_and_Maps/Grazing_Fees/gf_am.asp

USDA NRCS. (2003a). Rangeland and pastureland hydrology and erosion. In *National Range and Pasture Handbook.*

USDA NRCS. (2003b). *Soil Survey of Owyhee County Area, Idaho.* Boise, Idaho: Natural Resource Conservation Service.

USDA NRCS. (2006). *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin.* Washington D.C.: USDA Natural Resources Conservation Service.

USDA NRCS. (2010). *Ecological Site Descriptions (Draft).* Boise, Idaho: Available from the Idaho State Office of BLM or the Idaho Office of NRCS.

USDA NRCS. (2012). *Natural Resource Conservation Service Fact Sheets & Plant Guides*. Retrieved March 20, 2012, from http://plants.usda.gov/java/factSheet

USDA NRCS. (n.d.). *Idaho SNOTEL Sites*. Retrieved from http://www.wcc.nrcs.usda.gov/snotel/Idaho/idaho.html

USDA USFS. (2000). *Wildland Fire in Ecosystems: Effects of Fire on Flora.* USDA Forest Service Rocky Mountain Research Station.

USDA USFS. (2005). *Standard Fire Bevavior Fuel Models: A Comprehensive Set for Use with Rothermal's Surface Fire Spread Model.* USDA Forest Service Rockey Mountain Research Station.

USDA USFS. (2011). *Fire Effects Information System* . Retrieved from http://www.fs.fed.us/database/feis/

USDA USFS. (2012). *Fire Effects Information*. Retrieved May 7, 2012, from http://www.fs.fed.us/database/feis/plants/

USDI. (2010, August 31). Memorandum of Understanding Between the Bureau of Land Management and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds. Retrieved from http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/ib_attachments/2010.Par.67473.File.dat/IB2010-110_att1.pdf

USDI BLM. (1969). *Juniper Mountain Wildlife Habitat Management Plan.* Boise, Idaho.

USDI BLM. (1980). *Owyhee Grazing Environmental Impact Statement Draft.* Boise, Idaho: Bureau of Land Management Idaho State Office.

USDI BLM. (1981). *Owyhee Rangeland Management Program Summary Report.* Boise, Idaho: Bureau of Land Management Idaho State Office.

USDI BLM. (1982). *Bruneau-Kuna Grazing Environmental Impact Statement Draft.* Boise, Idaho: Bureau of Land Management Idaho State Office.

USDI BLM. (1987). *Elko Resource Management Plan and Record of Decision.* Elko, NV.

USDI BLM. (1991). *Idaho Wilderness Study Report, Volume 1.* Retrieved from http://www.blm.gov/style/medialib/blm/id/plans/idaho_wilderness_study/volume_1.Par.33337.File.dat/entiredoc.pdf

USDI BLM. (1998a). *A user guide to assess proper functioning condition and support science for lotic areas.* Technical Reference 1737-15. Retrieved from ftp://ftp.blm.gov/pub/nstc/techrefs/Final%20TR%201737-15.pdf

USDI BLM. (1998b). *Process for assessing proper functioning condition for lentic riparian-wetland areas.* Technical Reference 1731-11. Retrieved from ftp://ftp.blm.gov/pub/nstc/techrefs/Final%20TR%201737-11.pdf

USDI BLM. (1999a). *Owyhee Resource Management Plan.* Boise, ID.

USDI BLM. (1999b). *Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement.* FEIS, Lower Snake River District, Boise Field Office, Boise, ID.

USDI BLM. (1999c). *Sampling Vegetation Attributes.* Interagency Technical Reference 1734-4, Denver, CO. Retrieved from http://www.blm.gov/nstc/library/pdf/samplveg.pdf

USDI BLM. (1999d). *Utilization studies and residual measurement; Interagency Technical Reference 1734-3.* Denver, Colorado: Bureau of Land Management National Business Center.

USDI BLM. (2000). *Interpreting Indicators of Rangeland Health, Version 3.* Technical Reference 1734-6, Denver, CO. Retrieved from http://www.blm.gov/nstc/library/pdf/1734-6.pdf

USDI BLM. (2001a). *Ecological Site Inventory. Technical Reference 1734-7.* Denver, Colorado: Bureau of Land Management National Business Center.

USDI BLM. (2001b). *Proposed Southeastern Oregon Resource Management Plan and Final Environmental Impact Statement.* Portland, OR: Bureau of Land Management Oregon State Office.

USDI BLM. (2002). *Management Considerations for Sagebrush (Artemisia) in the Western United States: a selective summary of current information about the ecology and biology of woody North American sagebrush taxa.* Washington, D.C.: U.S. Department of the Interior Bureau of Land Management.

USDI BLM. (2002a). *Southeastern Oregon Resource Management Plan and Record of Decision.* Vale, OR.

USDI BLM. (2003a). *Assessment for Castlehead-Lambert (0634) and Jordan Valley (0592) Allotments.* Marsing, ID.

USDI BLM. (2003b). *Determination: Achieving Standards for Rangeland Health and Conforming with Guidelines for Livestock Grazing Management: Castlehead-Lambert (0634).* Marsing, ID.

USDI BLM. (2003c). *Idaho Bureau of Land Management Sensitive Species List.* Instruction Memorandum ID-2003-057, Boise, Idaho.
USDI BLM. (2004). *National Sage-grouse Conservation Strategy.* Retrieved from http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/fish__wildlife_and.Par.9151.File.dat/Sage-Grouse_Strategy.pdf
USDI BLM. (2005). *Interpreting Indicators of Rangeland Health, Version 4.* Technical Reference 1734-6, Denver, CO. Retrieved from http://www.blm.gov/nstc/library/pdf/1734-6rev05.pdf
USDI BLM. (2006a). *Evaluation and Determination: Achieving the Idaho Standards for Rangeland Health and Conformance with the Guidelines for Livestock Grazing Management.* Marsing, ID.
USDI BLM. (2006b). *Field Guide to the Special Status Plants of the Bureau of Land Management Twin Falls District, Jarbidge Field Office Area.* Idaho Technical Bulletin 2006-01. Retrieved from http://www.blm.gov/pgdata/etc/medialib/blm/id/publications/technical_bulletins/tb_06-1.Par.90597.File.dat/entiredoc.pdf
USDI BLM. (2008). *Manual 6840 – Special Status Species Management.* Retrieved from http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.43545.File.dat/6840.pdf
USDI BLM. (2009). *Managing Structures for the Safety of Sage-grouse, Sharp-tailed Grouse, and Lesser Prairie Chicken.* Instruction Memorandum 2010-022. Retrieved from http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2010/IM_2010-022.html
USDI BLM. (2010). *Crutcher Fire DNS2 – end of third year closing summary.* ESR Monitoring Report, Marsing, ID.
USDI BLM. (2011). *Idaho BLM Special Status Plants.* Retrieved from http://www.blm.gov/style/medialib/blm/id/publications.Par.18638.File.dat/Idaho%20Special%20StatusPlants2011.pdf
USDI BLM. (2012a). *Rangeland Health Assessment and Evaluation Report: Achieving the Idaho Standards for Rangeland Health: Castlehead-Lambert Allotment (0634).* Boise, Idaho: Bureau of Land Management Idaho State Office.
USDI BLM. (2012b). *Rangeland Health Assessment and Evaluation Report: Achieving the Idaho Standards for Rangeland Health: Garat Allotment (0584).* Boise, Idaho: Bureau of Land Management Idaho State Office.
USDI BLM. (2012c). *Rangeland Health Assessment and Evaluation Report: Achieving the Idaho Standards for Rangeland Health: Swisher Springs (0450) and Swisher FFR (0637) Allotments.* Boise, Idaho: Bureau of Land Management Idaho State Office.
USDI NRCS. (2012). *Mountain ball cactus (Pediocactus simpsonii)*. Retrieved June 29, 2012, from PLANTS Database: http://plants.usda.gov/java/profile?symbol=PESI
USDI USFWS. (1918). *Migratory Bird Treaty Act of 1918*. Retrieved from http://www.fws.gov/laws/lawsdigest/migtrea.html
USDI USFWS. (1940). *Bald Eagle Protection Act of 1940*. Retrieved from http://www.fws.gov/laws/lawsdigest/BALDEGL.HTML
USDI USFWS. (2004). *90-Day Finding on a Petition to Delist the Ute Ladies' Tresses Orchid.* Dept. of Interior. USDI USFWS. Retrieved June 25, 2012
USDI USFWS. (2008). *Birds of Conservation Concern 2008.* Division of Migratory Bird Management, Arlington, VA. Retrieved from http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf
USDI USFWS. (2009). Semi-annual Species List Update 14420-2010-SL-0081.
USDI USFWS. (2010a). *Biological Opinion on the effects of Bureau of Land Management ongoing livestock grazing actions in Idaho on the slickspot peppergrass (Lepidium papilliferum).* Report 14420-2010-F-0025, Boise, ID. Retrieved from http://www.fws.gov/idaho/publications/BOs/0025_BO_LepaBLMOnGoingGrazing_2010.pdf

USDI USFWS. (2010b). *Federal Register 50 CFR Part 17: Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered.* FWS-R6-ES-2010-0018. Retrieved from http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/FR03052010.pdf

USDI USFWS. (2011a). *Endagered Species Report, Owyhee County, Idaho.* Retrieved December 27, 2011, from Environmental Conservation Online System: http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=16073

USDI USFWS. (2011c). *Federal Register 50 CFR Part 17: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Lepidium papilliferum (Slickspot Peppergrass).* FWS–R1–ES–2010–0071. Retrieved from http://www.fws.gov/policy/library/2011/2011-27727.pdf

USDI USFWS. (n.d.). *Species in Owyhee County, ID*. Retrieved from Environmental Conservation Online System Species Reports: http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=16073

USDI USFWS; Federal Register 50 CFR Part 17: Endangered and Threatened Species. (1992). *Final Rule to List the Plant Spriantes Diluvialls (Ute Ladies' Tressess as a Threatened Species.* USDI. USDI. Retrieved June 25, 2012

USDI USGS. (2008). *Interactions among livestock grazing, vegetation type, and fire behavior in the Murphy Wildland Fire Complex in Idaho and Nevada, July 2007; Open-File Report 2008-1214.* Reston, Virginia.

USDI USGS. (2011, Last Modified: December 07). *National Hydrography Dataset*. Retrieved from http://nhd.usgs.gov/data.html

Vavra, M., Laycock, W. A., & Pieper, R. D. (1994). *Ecological Implications of Livestock Herbivory in the West.* Denver, Colorado: Society for Range Management.

Walker, B. L., & Naugle, D. E. (2011). West Nile virus ecology in sagebrush habitat and impacts on greater sage-grouse populations. In S. T. Knick, & J. W. Connelly (Eds.), *Greater sage-grouse: ecology and conservation of a landscape species and its habitats* (Vol. Studies in Avian Biology 38, pp. 127-144). Berkeley, California: University of California Press.

Warren, S. D., Thurow, T. L., Blackburn, W. H., & Taylor, Jr., C. A. (1986). The influence of livestock trampling under intensive rotation grazing on soil hydrologic characteristics. *Journal of Range Management*, *39*(6), 491-495. Retrieved from http://www.jstor.org/stable/3898755

West, N. E. (1999). Synecology and disturbance regimes of sagebrush steppe ecosystems. In P. G. Entwistle, A. M. DeBold, J. H. Kaltenecker, & K. Steenhof (Ed.), *Proceedings: Sagebrush Steppe Ecosystems Symposium* (pp. 15-26). Boise, ID: USDI BLM.

Western Range Services. (1997). *Garat Allotment July 1997 Ecological Status and Production Studies.* Elko Navada: Western Range Services.

Western Range Services. (2011). *Ecological Status and Production Analysis Report for the August 3-7, 2009 Studies in the Garat Allotment.* Marsing, Idaho: Available at the BLM Owyhee Field Office.

Whisenant, S. G. (1989). Changing Fire Frequencies on Idaho's Snake River Plains: Ecological and Management Implications. In E. D. McArthur, E. M. Romney, S. D. Smith, & P. T. Tueller (Ed.), *Proceedings--Symposium on Cheatgrass Invasion, Shrub Die-off and Other Aspects of Shrub Biology and Management* (pp. 4-10). Las Vegas, NV: USDA Forest Service Intermountain Research Station.

Wik, P. A. (2002). *Ecology of greater sage-grouse in south-central Owyhee County, Idaho.* Master's thesis, University of Idaho, Moscow, ID.

Wilcox, B. P., & Davenport, D. W. (1995). *Juniper encroachment: potential impacts to soil erosion and morphology.* Literature Review, Interior Columbia Basin Ecosystem Management Project. Retrieved from http://www.icbemp.gov/science/wilcox.pdf

Wood, J. C., Wood, M. K., & Tromble, J. M. (1987). Important factors influencing water infiltration and sediment production on arid lands in New Mexico. *Journal of Arid Environments*, *12*, 111-118.

Wood, M. K., & Blackburn, W. H. (1981). Sediment production as influenced by livestock grazing in the Texas rolling plains. *Journal of Range Management, 34*(3), 228-231. Retrieved from http://www.jstor.org/stable/3898048

Wood, M. K., & Blackburn, W. H. (1984). Vegetation and soil responses to cattle grazing systems in the Texas rolling plains. *Journal of Range Management, 37*(4), 303-308. Retrieved from http://www.jstor.org/stable/3898699

Wulfhorst, J. D., Rimbey, N. R., & Darden, T. D. (2003). *Social and Community Impacts of Public Land Grazing Policy Alternatives in the Bruneau Resource Area of Owyhee County, ID.* Agricultural Economics Extension Series No. 03-07, University of Idaho, Department of Agricultural Economics and Rural Sociology, Moscow, ID. Retrieved from http://www.cals.uidaho.edu/aers/PDF/AEES/2003/blmrmp9-03.pdf

Yensen, D. (1982). *A Grazing History of Southwestern Idaho with Emphasis on the Birds of Prey Study Area.* Moscow, Idaho: Department of Biological Sciences, University of Idaho.

Yensen, E., & Sherman, P. W. (2003). *Ground-dwelling squirrels of the Pacific Northwest.* Boise, Idaho: U.S. Fish and Wildlife Service and Bureau of Land Management.

Yeo, J. J. (2005). Effects of grazing exclusion on rangeland vegetation and soils, East Central Idaho. *Western North American Naturalist, 65*(1), 91-102.

Zoellick, B. W. (2004). Density and biomass of redband trout relative to stream shading and temperature in southwestern Idaho. *Western North American Naturalist, 64*(1), 18-26.

7 APPENDICES

See Appendices section on the website

8 MAPS

See Maps section on the website