BLM

Owyhee Field Office

Garat Allotment
Livestock Grazing Permit Renewal
Preliminary Environmental Assessment

EA #DOI-BLM-ID-B030-2014-0015-EA

October 2014

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 # DOI-BLM-ID-B030-2014-0015-EA

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1 INTRODUCTION

1.1 Title

Garat Allotment 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 the livestock grazing permit on the Garat allotment in Owyhee County, Idaho, for a term of 10 years (Map GEN-1).

The BLM Owyhee Field Office 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 for issuing final decisions and grazing permits for a number of allotments. The Garat, Castlehead-Lambert, Swisher Springs and Swisher FFR allotments were grouped together and named the Owyhee River Group (Group 1), with analysis of alternatives completed in a common environmental assessment (EA), DOI-BLM-ID-B030-2012-0012-EA.

The four Owyhee River Group allotments in the environmental assessment, 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 were received by BLM in 2011 from permittees who were authorized to graze livestock in these allotments. The Petan Company of Nevada, Inc., submitted an application to renew a permit to graze livestock on the Garat allotment dated June 29, 2011, as revised November 21, 2011, and as amended and superseded by an application received February 12, 2013.

Upon completion of the EA for the Owyhee River Group allotments in January 2013, proposed decisions and subsequent final decisions were issued to renew 10-year permits to authorize livestock grazing within each of the four allotments. Petan Company of Nevada, Inc., and others appealed the decision to renew the grazing permit for use in the Garat allotment. The Office of Hearings and Appeals issued an Order dated February 13, 2014, which found that BLM did not consider a reasonable alternative that included the utilization of range improvement projects within the EA and did not provide legitimate reasons for not considering these projects in the EA. The Order set aside and remanded the final decision to renew the grazing permit for the Garat allotment to BLM to correct NEPA inadequacies regarding projects. This EA addresses the basis for the Office of Hearings and Appeals remand by considering range improvements in the BLM's NEPA analysis.

The renewed grazing permit for use in the Garat allotment 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 the grazing regulations; 43 CFR § 4100 – Grazing Administration.

Federal actions must be analyzed in accordance with NEPA and other relevant Federal and State laws and regulations to determine potential environmental consequences.

Table ALLOT-1: Lands involved in the Garat allotment grazing permit renewal

Meridian	Township	Range	Sections	Acres PD
Boise	13S	2W	31, 32	202,618
	13S	3W	26, 34-36	
	13S	4W	20, 21, 22, 27-36	
	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	

Allotment Setting and Grazing Authorization

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. 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 identified in the current allotment grazing schedule and additional enclosures (Table ALLOT-2, Maps RNGE-1 through 9).

Table ALLOT-2: Total acres by pasture and ownership within the Garat allotment

Allotment	Pasture	Pasture Name	Public	State	Private	Total
Garat	1	Dry Lake	14,551	636	0	15,187
	2	Piute Creek	19,775	635	0	20,410
	3	Forty-Five	42,806	1,644	0	44,451
	4	Kimball	37,957	2,519	45	40,522
	5	Big Horse	37,593	921	77	38,592
	6	Juniper Basin	48,456	2,481	85	51,022
	7	Piute Camp Enclosure	7	0	0	7
	8	Piute Creek Enclosure	117	0	0	117
	9	Four Corner Camp West	130	0	0	130

Allotment	Pasture	Pasture Name	Public	State	Private	Total
	10	Four Corner Camp #2	389	0	0	389
	11	Stateline Camp	835	0	0	835
Total			202,618	8,837	208	211,663

The Owyhee Resource Management Plan (ORMP), the land use plan for Owyhee Field Office, categorized Garat allotment as an Improve (I) category allotment with a low priority for management when compared to other (I) category allotments. Categorization of allotments in the ORMP prioritizes 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 identifies issues associated with livestock grazing with a list of resource concerns and applicable ORMP resource objectives. Identified resource concerns include the high erosion potential on more 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, redband trout, and sage-grouse). Applicable ORMP management objectives identified include SOIL-1, VEG-1, WATR-1, RIPN-1, WDLF-1, and SPSS-1[1].

One grazing permit authorizes livestock grazing use of the Garat allotment. The current total permitted use for livestock grazing in the Garat allotment is 33,646 cattle and horse animal unit months (AUMs)[2], of which 19,500 AUMs are active, 3,250 AUMs are held in voluntary non-use, and 10,896 AUMs are suspended (Table ALLOT-3).

Table ALLOT-3: Total permitted use for individual permittee in the Garat allotment

Permittee	Active Use	Voluntary Non-use[a]	Suspension	Total
Petan Company of Nevada, Inc.	19,500	3,250	10,896	33,646

[a] 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[3].

[1] See Section 1.7 of this EA for resource objectives for the ORMP (USDI BLM, 1999a).
[2] 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.
[3] Voluntary non-use, as applied from the 1989 Agreement, is not defined in current regulation (July 11, 2006). The definition of active use is (43 CFR § 4100.0-5): "Active use means the current authorized use, including livestock grazing and conservation use. Active use may constitute a portion, or all, of permitted use. Active use does not include temporary nonuse or suspended use of forage within all or a portion of an allotment." Note that the reference to "conservation use" in this definition no longer applies [Public Lands Council v. Babbitt, 529 U.S. 728 (2000)]. The definition of permitted use is (43 CFR § 4100.0-5): "the forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in AUMs." The definition of temporary nonuse is (43 CFR § 4100.0-5): "the authorized withholding, on an annual basis, of all or a portion of permitted livestock use in response to a request of the permittee or lessee." Finally, regulation provides for decreasing permitted use on a temporary basis or permitted use shall be reduced (43 CFR § 4110.3-2) in stating, "Permitted use may be suspended in whole or in part on a temporary basis due to drought, fire, or other natural causes, or to facilitate installation, maintenance, or modification of range improvements. When monitoring or field observations show grazing use or patterns of use are not consistent with the provisions of subpart 4180, or grazing use is otherwise causing an unacceptable level or pattern of utilization or, when use exceeds the livestock carrying capacity as determined through monitoring, ecological site inventory or other acceptable methods, the authorized officer shall reduce permitted grazing use or otherwise modify management practices."

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 permit authorizes up to 19,401 AUMs of grazing use by cattle and 99 AUMs of use with 15 horses between March 15 and September 30. The allotment is divided into six pastures identified in the 1989 management agreement grazing schedule (Table ALLOT-2, Maps RNGE-1 through 6). Table ALLOT-4 identifies the current grazing schedule established in the 1989 management agreement. Grazing practices within additional enclosures (pastures 7-11 of Table ALLOT-2) are not defined in the permit or the 1989 management agreement.

Table ALLOT-4: 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 250 head of strays 10/1-10/15

Garat Allotment Standards for Rangeland Health

A Rangeland Health Assessment and Evaluation Report for the Garat allotment was completed and dated January 2012. In addition, the Field Office Manager signed a Determination for Achieving Standards for Rangeland Health and Conforming with Guidelines for Livestock Grazing Management for the Garat allotment on August 28, 2012. The determination was made available to the public for comment along with the preliminary Environmental Assessment for the Owyhee River Group 1 allotments in September 2012. After the Garat allotment Final Decision was remanded back to the BLM in February 2014, the BLM decided to use the opportunity to revisit and supplement information related to riparian areas and the assessment of Standard 2. Thus, the BLM interdisciplinary team updated the riparian information and modified the Rangeland Health Assessment and Evaluation Report, with revisions under the discussion of Standard 2 that were needed to address the riparian proper functioning condition directly and also under other standards that are indirectly related to riparian condition. The 2014 Rangeland Health Assessment/Evaluation (USDI BLM, 2014b) and Determination (Appendix F) for Achieving Standards for Rangeland Health and Conforming with Guidelines for Livestock Grazing Management for the Garat allotment supersede and replace the 2012 documents.

The Idaho Standards for Rangeland Health not met in the Garat allotment include: 1 – Watersheds, 2 – Riparian Areas and Wetlands, 4 – Native Plant Communities, and 8 – Threatened and Endangered Plants and Animals. Standard 7 – Water Quality is met. Standards 3 – Stream Channel/Floodplain, 5 – Seedings, and 6 – Exotic Plant Communities other than Seedings do not apply to the Garat allotment. Historic livestock grazing management practices and wildfire are causal factors for failing to meet Standard 1, while current livestock grazing management practices are significant factors in failing to meet Standards 2, 4, and 8. Livestock management practices do not conform to Idaho Guidelines for Livestock Grazing Management 4, 5, 8, 9, 12, and 20.

The Rangeland Health Assessment and Evaluation Report and the Determination (Appendix F) for the Garat allotment are incorporated into this NEPA document by reference.

A summary of the findings and determinations for the Garat allotment is provided in Table RHA-1.

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

Standards are met	Standards are not met	Standards are not applicable	Current livestock management practices are significant factors	Other factors
7	1, 2, 4, 8	3, 5, 6	2, 4, 8	1

1.4 Purpose and Need

The purpose of this action is to consider the renewal of the permit to graze livestock within the Garat allotment with the existing infrastructure[4] and in a manner that provides 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).[5]

The need for this action is established by the Taylor Grazing Act (TGA), the Federal Land Policy and Management Act (FLPMA), the ORMP, and the grazing regulations (43 CFR § 4130.1), which require that the BLM respond to applications to fully process and renew permits to graze livestock on public land. The analysis of the actions applied for and the alternative actions considered are 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. The rangeland health assessment and evaluation report completed for the Garat allotment identifies a number of standards that have not been met (USDI BLM, 2014b).
- The ORMP identifies resource management objectives and management actions that guide the management of a broad spectrum of land uses and allocations for public lands in the Owyhee Field Office. The ORMP allocated public lands within the Garat allotment as lands 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 that is part of the project record but is not included as an appendix to this EA document consists of:

[4] Infrastructure is synonymous with range improvement, as defined in the grazing regulations. 43 CFR § 4100.0-5 defines "range improvement" as an authorized physical modification or treatment which is designed to improve production of forage; control patterns of use; provide water; stabilize soil and water conditions; restore, protect, and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. The term includes, but is not limited to, structures, treatments, projects, and use of mechanical devices or modifications achieved through mechanical means.

[5] See section 2.6-Alternatives Considered but Not Analyzed for a discussion of the rationale to renew the permit to graze livestock within the Garat allotment without adding additional infrastructure

- 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 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 the Owyhee River Group 1 Allotments Livestock Grazing Permit Renewal Environmental Assessment (DOI-BLM-ID-B030-2012-0012-EA, hereby referred to as the Group 1 EA) 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.

BLM released the completed Group 1 EA to the public in January 2013. Upon appeal of a decision to renew the permit to graze livestock within the Garat allotment, as stated in Section 1.1, the Office of Hearings and Appeals found that BLM did not consider a reasonable alternative that included the utilization of range improvement projects within the EA, and did not provide legitimate reasons for not considering these projects in the EA. Additional intensive scoping was not completed during BLM's efforts to supplement the EA and reissue another decision in accordance with the February 13, 2014, Order of the Administrative Law Judge.

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. Ms. Fite 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. She identified the need to protect sage-grouse habitat as a primary concern of WWP. She also questioned the validity of the data used to complete the rangeland health assessments, and commented 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 EA for these allotments.

Petan Co. of NV commented on the sections of the Rangeland Health Assessments/Evaluation Report 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.

IDEQ stated that it does not comment on individual projects but noted that the BLM should ensure that this project complies with a number of state air and water quality regulations.

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 the Garat allotment:

- 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: Prevent introduction and spread of noxious and invasive annual species (e.g., cheatgrass).
- Issue 4: Improve riparian vegetation and stream-bank stability associated with streams and springs/seeps.
- Issue 5: Protect special status plants and improve the habitats supporting special status plants.
- Issue 6: Improve wildlife habitats, and habitats necessary to meet objectives for sagebrush-dependent species, including sage-grouse and other special status wildlife species.
- Issue 7: Consider whether grazing within the Garat allotment can be used to limit wildfire.
- Issue 8: 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 the Owyhee Field Office, including the authorization of livestock grazing through permit within the Garat allotment and also any connected authorization of crossing permits to trail livestock across public land associated with grazing use in the allotment. Based on the results of the NEPA analysis, the authorized officer will make an informed decision whether, and under what terms and conditions, to renew the grazing permit and authorize crossing permits. If grazing and crossing permits are offered, management actions, mitigation measures, and monitoring requirements will be prescribed for the allotment 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 [6]
- Idaho Comprehensive Wildlife Conservation Strategy 2005
- Idaho Forest Practices Act (1974), Title 38, Chapter 13, Idaho Code
- 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

[6] 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

- 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

The five alternatives are considered and analyzed in detail in this EA include a current-situation alternative, the applicant's proposed action, 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 in detail, as identified in Section 2.6. Sections 2.1 through 2.5 describe in detail the authorization and actions of each of the five alternatives and terms and conditions of the permit in the sections that follow; Appendix D provides a comparison table of authorization and actions included in each of the five alternatives.

2.1 Alternative 1 – Current Situation

Under Alternative 1 – Current Situation, the permit for grazing use within the Garat allotment would be renewed consistent with the terms and conditions of the current permit, although with changes to reflect summarized actions that have led to the current conditions. This alternative re-authorizes the livestock management actions that resulted in the current resource conditions and will provide the baseline for comparison of environmental effects resulting from implementation of other alternatives. The pasture-specific seasons of grazing use, with the duration and frequency of use consistent with recent grazing practices, would define the grazing schedule. Authorized active use would be consistent with recent maximum actual use[7].

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 WWP 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 by the court 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.

[7] A summary of the no-action alternative, renewal of the grazing permits consistent with existing terms and conditions, is provided in the Alternatives Considered but not Analyzed Section (2.3) of this environmental assessment.

The interim terms and conditions above would be incorporated as “other terms and conditions” in the permit offered for grazing use within the Garat allotment with implementation of Alternative 1 – Current Situation.

The average actual use reported during the past 10 years (2004 through 2013) for the Garat allotment has been 13,641 AUMs, with a maximum of 18,870 AUMs reported in 2006. The maximum actual use that has occurred within the past 10 years provides the basis for actions that have led to the current conditions and would be the level of use authorized under Alternative 1.

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 18,870 AUMs active use, as outlined in Table ALT-1. The alternative includes the elimination of 630 active use AUMs and 3,250 voluntary non-use AUMs from permitted use.

Table ALT-1: 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-2 would continue to be included as a term and condition of the permit. Flexibility in the established grazing schedule to adjust annual use 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 2004 and 2013, would continue to be implemented (See Appendix B for a summary of actual use reported for the Garat allotment). In addition to the established grazing schedule for the Garat allotment between March 15 and September 30, the permit would continue to provide for flexibility at the end of the grazing season for 250 strays between October 1 and October 15.

The existing enclosures at Piute Camp, Four Corners Camp, and Stateline Camp (Maps RNGE-2, 3, 4, 5, and 6, 7, 8, and 9) would be managed concurrent with pastures 1 through 6 of the grazing schedule in Table ALT-2. Authorization would include saddle-horse use within the allotment as a whole for 15 horses between 3/15 and 9/30, with a maximum of 99 AUMs through the grazing season.

Table ALT-2: 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
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).

Mandatory and other terms and conditions of the offered permit would be defined as listed in Table ALT-3 and the terms and conditions following the table.

Table ALT-3: 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*	Type Use	AUMs
	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

* 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

1. 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;

2. 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;
3. 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
4. Stream bank damage attributable to grazing livestock will be less than 10 percent on a stream segment.

2.2 Alternative 2 – Applicant's Proposed Action

BLM received an application on August 21, 2014, for renewal of the grazing permit from Petan Company of Nevada, Inc., the current permittee authorized to graze livestock within the Garat allotment.[8] The application included two options, both of which were identified as the preferred alternative. While Option I was largely similar to the revised application received by BLM in February 2013, Option II included a grazing strategy that incorporated management guidelines similar to management constraints used to develop Alternative 4. Option I is analyzed as the Applicant's Proposed Action. Because Option II has similarities to Alternative 4, results in greater impacts to resource values than those impacts identified in the analysis of Alternative 4, and is based on rationale provided in the section titled Alternatives Considered but Not Analyzed in Detail (Section 2.6), detailed analysis of Option II was not warranted (BLM NEPA Handbook at 6.6.3). Project construction proposed within Options I and II of the application is not consistent with the purpose and need and thus was not analyzed in detail based on rationale provided in the section titled Alternatives Considered but Not Analyzed in Detail (Section 2.6). Finally, vehicular use authorization in designated wilderness that was requested in Options I and II of the application was not analyzed in detail based on rationale provided in the section titled Alternatives Considered but Not Analyzed in Detail (Section 2.6). The complete application with Option I and Option II received on August 21, 2014, can be found in Appendix E.

Under Alternative 2, BLM would renew the livestock grazing permit in accordance with terms and conditions within the application received on August 21, 2014. 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.

Petan would be offered a grazing permit for a term of 10 years. Voluntary non-use of 3,250 AUMs under the 1989 Management Agreement would be converted to active use in two phases, as summarized in Table ALT-4. During years 1 through 3 of the permit, 764 AUMs of the 3,250 AUMs of voluntary non-use under the 1989 Agreement would be authorized as active use. During years 4 through 10, all of the 3,250 AUMs of voluntary non-use would be authorized as active use. With the phased conversion of voluntary non-use AUMs to active use, 20,264 AUMs of active use would be authorized in the Garat allotment during years 1 through 3 of the 10-year permit and 22,750 AUMs of active use would be authorized in years 4 through 10.

Active use authorized under Alternative 2 would increase by 1,394 AUMs during years 1 through 3 of the 10-year permit and increase 3,880 AUMs during years 4 through 10, as both compared to the current situation under Alternative 1. The increase in active use AUMs would occur with a greater number of

[8] BLM initiated the grazing permit renewal process for the Group 1 allotments in mid-2011. BLM requested and received an application for permit renewal from Petan Company of Nevada, Inc. dated June 29, 2011, and as revised November 18, 2013, and again revised on February 13, 2013. Following the completion of riparian PFC assessment of three reaches of Piute Creek in 2014, BLM completed the 2014 Garat Determinations that superseded determinations used in the Group 1 EA. Petan submitted the August 21, 2014, application when provided the opportunity following release of the 2014 Determination.

cattle authorized during the existing grazing period, March 15 through September 30. The permit would continue to provide for flexibility at the end of the grazing season for 250 strays between October 1 and October 15.

Table ALT-4: Permitted grazing use within the Garat allotment with implementation of Alternative 2 – Applicant's Proposed Action through the 10-year term of the permit

Year	Active Use	Voluntary Non-use[9]	Suspension	Permitted Use
1 - 3	20,264 AUMs	2,486 AUMs	10,896 AUMs	33,646 AUMs
4 - 10	22,750 AUMs	0 AUMs	10,896 AUMs	33,646 AUMs

Consistent with the August 21, 2014, grazing application for the Garat allotment, mandatory and other terms and conditions of the offered permit would be defined as listed in Table ALT-5 and the terms and conditions following the table.

Table ALT-5: 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
	Number	Kind	Begin	End			
00584 Garat	3,042	Cattle	03/15	09/30	96	Active	19,202
	250	Cattle	10/1	10/15	96	Active	118
	25	Horse	03/15	10/15	100	Active	177
	121	Cattle	03/15	09/30	96	Active	764
	394	Cattle	03/15	09/30	96	Active	2,487

- Lines 1, 4, and 5 reflect a grazing season for cattle in the Garat allotment of March 15 through September 30.
- Line 2 provides management flexibility for strays at the close of the grazing season, not to exceed 250 head from October 1 and October 15.
- Line 3 provides management flexibility for an average of 25 head of horses through the grazing season within the horse fields located near Stateline Camp and Four Corners Camp[10]. Approximately 15 saddle horses may be kept at one or both of these locations season-long, but not to exceed 75 horses during periods when cattle are being moved between pastures or during branding; not to exceed 177 AUMs.
- Line 4 reflects an application to authorize 764 AUMs of the 3,250 AUMs of voluntary non-use prescribed by the 1989 Agreement, which Petan applies to be activated from year 1 through year 10 of the renewed grazing permit, or until the next permit renewal decision is issued, whichever is later.
- Line 5 reflects an application to schedule 2,487[11] AUMs of the 3,250 AUMs of voluntary non-use prescribed by the 1989 Agreement, which Petan applies to be activated from year 4 through year 10 of the renewed grazing permit, or until the next permit renewal decision is issued, whichever is later. Petan will continue applying for voluntary non-use to the extent of 2,487 AUMs from year 1 through year 3.
- Lines 1-4 total 20,261 AUMs, consistent with an overall stocking rate of 10 acres per AUM upon

[9] See footnote discussing voluntary non-use in Section 1.3.
[10] Enclosures identified as Stateline Camp and Four Corners Camp are located on maps GEN-1 and RNGE-3 to 6.
[11] Note that lines 4 and 5 in combination make application to increase active use by 3,251 AUMs as opposed to the narrative that refers to 3,250 AUMs of voluntary non-use instituted in the 1989 agreement.

the 202,618 public acres within the Garat allotment.

- Lines 1-5 total 22,748 AUMs, consistent with the 22,750 AUM active permitted use specified by the approved Owyhee Resource Management Plan dated December 30, 1999. Petan's permitted use includes 10,896 suspended AUMs, for 33,646 AUMs of total permitted use associated with this application for permit renewal.

The following Other Terms and Conditions will apply to the grazing permit for the Garat allotment, in addition to the terms and conditions printed on the face of Form 4130-1 (Grazing Schedule: Grazing Application) and the Standard Terms and Conditions printed on the back (page 2) of Form 4130-1 to which this "Appendix: August 2014 Grazing Application" is affixed:

1. Grazing use will be in accordance with the provisions set forth in "Appendix to Grazing Application" for the Garat allotment (#00584) dated August 2014, which serves as the functional equivalent of an Allotment Management Plan for the Garat allotment.
2. Line 2 of the schedule above provides management flexibility for strays at the close of the grazing season; not to exceed 250 head from 10/1 to 10/15.
3. Line 3 of the schedule above provides management flexibility for an average of 25 head of horses through the grazing season within the horse fields located near Stateline Camp and Four Corners Camp. Approximately 15 saddle horses may be kept at one or both of these locations season-long, but not to exceed 75 horses during periods when cattle are being moved between pastures or during branding; not to exceed 177 AUMs.
4. Livestock turnout dates are subject to the following range readiness criteria. Range readiness is defined as that point in time when the soils have firmed after the spring thaw, when squirrel-tail (SIHY) has at least 2-4 inches new growth, and bluebunch wheatgrass (AGSP) has 4-6 inches 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 after mutual agreement with the BLM.
5. Your completed 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 or similar authorization may be required prior to crossing public lands.
8. Range improvements must be maintained in accordance with the cooperative agreement and range improvement permits to which you are a signatory or assignee.
9. Petan is authorized to place salt and to access and maintain its range improvements within the Owyhee River Wilderness areas located in the Garat Allotment with motorized vehicles and equipment consistent with the management practices in such areas prior to their designation as wilderness. Petan's range improvements within the Owyhee River Wilderness areas located in the Garat allotment are listed on page 14 of the Appendix A of the April 2014 Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Management Plan and Environmental Assessment (Wilderness Plan), and are depicted on the map at page 33 of Appendix B of said Wilderness Plan.[12]
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

[12] Other term and condition #9 from the application would authorize motorized and mechanized uses within designated wilderness. Motorized and mechanized use in designated wilderness was considered but not analyzed in detail as described in Section 2.6.5 and is not discussed more in this alternative.

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. You will be annually billed for your grazing use after-the-fact based upon your "as filed" Actual Use Report Form, or its equivalent.[13]
13. Grazing Strategy: The grazing strategy presented below provides a framework for a grazing system within the Garat allotment designed to continue to meet Owyhee RMP goals and objectives and conform to Idaho Rangeland Health Standards, while allowing adjustments due to annual variability in precipitation, forage production, and livestock water availability without placing undue demands and stress upon BLM staff and resources. Likewise, the mid-season (5/16-7/30) overlap in use periods is allowed to ensure that livestock movement between pastures occurs in a controlled fashion to optimize the distribution of livestock between pastures within the Garat allotment.

Table ALT-6: Garat allotment grazing strategy

Pasture	Season	Dates
Dry Lake 1 (Pasture 1)	Spring	3/15 to 6/30
Dry Lake 2[a] (Pasture 2)	Spring	3/15 to 6/30
Forty-Five (Pasture 3)	Spring	3/15 to 6/30
Big Horse (Pasture 5)	Spring	3/15 to 6/30
Kimball (Pasture 4)	Flexible	3/15 to 6/30 or 6/15 to 9/30
Juniper Basin (Pasture 6)	Summer	6/16 to 9/30

[a] May be renamed the Piute Creek pasture after the proposed Piute Creek fence improvement is completed.

- Avoid grazing spring pastures between 4/15 and 6/15 at least once every 3 years.
- Graze at least two of the spring pastures between 3/15 and 5/15 each year.
- If mid-season water is adequate, use 1 to 3 of the spring pastures longer (as late as 6/30), and defer grazing the Kimball and Juniper Basin pastures until after 6/15.
- If water is scarce in spring pastures, graze the Kimball pasture anytime during the spring period (3/15 – 6/30) and graze the Juniper Basin pasture as early as 6/15, distributing cattle as needed.
- Defer grazing the Kimball pasture until after 6/15 at least once every 3 years, or rest it once every 5 years.
- Utilization may not exceed 50 percent of the current year's growth.
- Management flexibility for strays: Not to exceed 250 head from 10/1 to 10/15.

14. Grazing outside the parameters established herein may be allowed within the Garat allotment upon prior notification and approval by an authorized officer of the BLM.[14]
15. Petan will cooperate with the Idaho Department of Lands to identify, evaluate, and install range

[13] After the fact billing is not analyzed in this NEPA document because it is an opportunity when an allotment management plan or its equivalent has been prepared in careful and considered consultation, cooperation, and coordination. Authorization of after the fact is an administrative process upon approval by the authorized officer. (43 CFR § 4120.2) (43 CFR § 4130.8-1(e))

[14] Term and Condition #14 anticipates extreme flexibility in livestock management practices at the discretion of the authorized officer. Authorization of livestock management practices defined at some later date would require new authorization, including compliance with the NEPA. Therefore, Term and Condition #14 does not meet the purpose and need.

improvement stock wells upon State owned lands associated with Petan's Idaho State Grazing Lease G-6570 to improve livestock distribution within the Garat allotment, particularly within the following Idaho State sections:[15]

- Highest Priority: T15S R3W, Section 36; T15S R2w, Section 36; T16S R2W, Section 16.
- High Priority: T14S R2W, Section 16; T15S R3W, Section 16; T15S R1W, Section 16 & 36; T 16S R1W, Section 16.
- Moderate Priority: T14S R4W, Section 16 & 36; T14S R3W, Section 36.

16. Petan and the BLM will cooperate to evaluate and complete the Piute Creek fence improvements depicted in Map 1, titled "Map 1: Piute Creek Fence Improvements" hereby attached and incorporated by references. These range improvements are a modification of the cross-fence layout in the Piute Creek/Piute Basin area from the improvements that were presented in our June 27, 1997 "comments to the Draft Owyhee Resource Management Plan and Draft Environmental Impact Statement" to avoid potential delays in approving and completing such range improvements in light of the Owyhee River Wilderness that was designated by Congress after Petan's June 27, 1997, fence improvement proposal. The Piute Creek fence improvements depicted herein are range improvements projects that would improve livestock distribution in the Garat Allotment and increase management flexibility, without requiring that any improvement structures be constructed within the Owyhee River Wilderness, The Piute Creek fence range improvement would create a water lot around Piute Basin Reservoir that would provide access to stock water from both Pasture 2 (the Dry Lake 2 pasture [or Piute Creek pasture][16]) and Pasture 3 (the Forty-Five Pasture). As is the case for the fence to be removed by these proposed improvements, maintenance for the new fence will be Petan's responsibility.[17]
17. Petan and the BLM will cooperate to identify and evaluate additional range improvement projects to improve livestock distribution within the Garat Allotment, particularly projects where existing or additional livestock water sources could be restored, improved, or developed in pastures herein identified as Spring pastures. As such projects are identified, Petan and the BLM will cooperatively assess their feasibility and potential to improve livestock distribution within the Garat allotment. The BLM will provide the necessary environmental and cultural clearances needed to implement such projects.[18]
18. Petan recognizes the two existing well locations in the Big Horse pasture of the Garat allotment known as Middle Windmill and 45 Windmill as high priority sites that could be completed to provide livestock water to significantly improve livestock distribution in the Big Horse pasture. These two locations have potential to provide livestock water at each old windmill site, as well as to significant additional acreage in the Big Horse pasture by means of gravity fed pipelines to

[15] BLM management authority does not extend to Idaho State Lands, and therefore analysis of the consequences of identifying, evaluating, or installing proposed range improvements on state land is not analyzed in this NEPA documents.
[16] The Dry Lake 2 pasture could be renamed the Piute Creek pasture after the fence improvements are completed.
[17] The purpose and need stated in section 1.4 is to consider the renewal of the permit to graze livestock within the Garat allotment with the existing infrastructure. Additional rationale for not considering new project construction during permit renewal is provided in section 2.6- Alternatives Considered but Not Analyzed in Detail. The Piute Creek fence improvements were not analyzed in detail in this NEPA document.
[18] The purpose and need stated in section 1.4 is to consider the renewal of the permit to graze livestock within the Garat allotment with the existing infrastructure. As noted in Section 2.6- Alternatives Considered but Not Analyzed in Detail, detailed analysis of projects with little description of type, location, or layout was not completed in this NEPA document.

lower elevation areas. Petan and the BLM will begin a cooperative process as soon as workloads allow, in order to determine what would be required to restore these wells and their associated water delivery structures to a functioning condition, and to develop a pipeline system from one or both sites to provide water to additional acreage downhill from the existing well locations.[19]

19. 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.

2.3 Alternative 3 – Performance-based

Under Alternative 3, terms and conditions of the grazing permit 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 to the failure to meet the standards and objectives. Resource issues addressed by Alternative 3 are identified in the 2014 Rangeland Health Assessments and Evaluation Report for the Garat allotment (USDI BLM, 2014b). Alternative 3 adds performance-based terms and conditions to the grazing permit (Table ALT-6 and the terms and conditions following Table ALT-9). 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 allotment, pasture rotations, pasture seasons of use, or active use AUMs from the existing permit. Alternative 3 only differs from the current permit with the addition of performance-based terms and conditions. Flexibility would be provided to allow 7 days to complete moves between pastures.

To facilitate meeting Rangeland Health Standard 4 – Native Plant Communities and to meet the ORMP vegetation management objective VEG-1, a utilization limit of less than or equal to the Slight category (less than or equal to 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) (Table ALT-6 and the terms and conditions following Table ALT-9). 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 a number of sources recommend providing at least 2 years of deferment for each year of active-growing-season use. The grazing schedule under Alternative 3 would continue to include more frequent growing-season use. However, 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

[19] The purpose and need stated in section 1.4 is to consider the renewal of the permit to graze livestock within the Garat allotment with the existing infrastructure. As noted in Section 2.6- Alternatives Considered but Not Analyzed in Detail, detailed analysis of these wells and any pipelines associated with these wells was not completed in this NEPA document.

season to be the limiting factor, as opposed to frequent deferment of grazing use to a period outside the active growing season or year-long rest, that would provide for maintenance and improvement of perennial vegetation health and vigor.

To facilitate meeting Standard 2 – Riparian Areas and Wetlands, Standard 7 – Water Quality, and the ORMP riparian management objective for lentic systems, (RIPN-1), terms and conditions of the grazing permit would establish minimum riparian stubble height limits to woody browse, and limits to edge shear (Table ALT-6). 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, flood plains, and springs to erosive hydrologic forces and alter water flow patterns. Standard 3 – Stream Channel/Floodplain does not apply to resources present within the Garat allotment (USDI BLM, 2014b).

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 permit would establish minimum perennial herbaceous vegetation height limits in important upland habitats (Table ALT-6 and the terms and conditions following Table ALT-9). 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, 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 that adequate vegetation structure and cover for breeding, nesting, and foraging is maintained within riparian habitats.

Monitoring would be conducted at representative key areas within pastures of the allotment 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. 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 a MMIM site may be used to measure conditions of both riparian lentic and riparian (lentic) 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, livestock grazing use would be temporarily suspended until terms and conditions of the grazing permit are changed to make significant progress toward meeting Owyhee Resource Management Plan objectives and the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.[20] 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

[20] The permittee retains 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.

(i.e., 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-6 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 the allotment, the metric for that term and condition within each pasture would be monitored again at a minimum of once 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 indicate a history of compliance and implementation of appropriate livestock management practices to protect and enhance resource values, and thus a reduced need for compliance monitoring. 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.

Table ALT-6: 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[21] within pastures scheduled for active growing season use to no greater than the slight category[22] (≤20%)	At or about the end of the active growing season for upland bunchgrass species (July 1)[23] when active growing season (May 1 – July 1) grazing use is scheduled for a pasture.

[21] 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.

[22] 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 Garat allotment. 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.

[23] 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 Lentic	ORMP RIPN 1: Attain and maintain riparian-wetland areas to attain proper functioning and satisfactory condition. Riparian-wetland areas 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 Lentic Edge Alteration; Appendix C/ MMIM[14] TR 2011	Within key riparian (lentic) areas[24]: inches %	Stubble Height ≥ 6” Edge Shear (alteration) ≤ 20%	Measure at the end of the grazing season in key riparian areas that were grazed that year
Sage-grouse Upland Habitat	ORMP SPSS 1: Manage special status species and habitats to increase or maintain populations	Perennial Herbaceous Vegetation Height[25]	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 (Preliminary Priority Habitat) -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.

[24] 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.
[25] 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) and USDI BLM (2010).

Resource	Resource Objective	Method	Metric	Threshold	Sampling Period
Riparian (lentic) 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[26] Woody Species Use[27]	Within key riparian (lentic) areas[28]: Mean stubble height (inches) of all key species; Average use (%) for all woody species	Stubble height ≥6 inches Woody species use to ≤30%	Conduct post-grazing season simultaneously with lentic riparian monitoring above

[26] Stubble height technique as described in the Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation* (USDI BLM, 2011)
[27] 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)
[28] 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

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 permit (see terms and conditions #13-16 below and Table ALT-6).

Petan would be offered a 10-year grazing permit with an active use of 19,500 AUMs as outlined in Table ALT-7. The alternative includes no change in the active use AUMs or suspension AUMs held by the permittee, but does eliminate 3,250 voluntary non-use AUMs from permitted use.

Table ALT-7: 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-8 would continue to be a term and condition of the permit. Flexibility would be provided to allow 7 days to complete moves between pastures, so long as the performance-based terms and conditions are met.

The existing enclosures at Piute Camp, Four Corners Camp and Stateline Camp (Maps RNGE-2, 3, 4, 5, and 6, 7, 8, and 9) would be managed concurrent with pastures 1 through 6 of the grazing schedule in Table ALT-8. Authorization would include saddle horse use within the allotment as a whole for 15 horses between 3/15 and 9/30, with a maximum of 99 AUMs through the grazing season.

Table ALT-8: 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-9 and the terms and conditions following the table.

Table ALT-9: 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 does not equal the active use AUMs for the authorization or allotment due to rounding in the AUM calculation.
[2] The existing 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 that would be offered under Alternative 3. 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.[29]
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.[30]
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.

[29] The Boise District Range Readiness Criteria (Appendix J) were developed to ensure adequate early season growth of forage species and soil conditions to support livestock turnout, while limiting early season impacts to resources. While criteria related to soil moisture may support livestock turnout without potential for excessive compaction of saturated soils, spring rains subsequent of appropriate livestock turnout may lead to saturated soils and compaction from hoof action.
[30] See section 2.6.5 for a discussion of the BLM process for consideration of access and maintenance requests associated with livestock grazing.

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.

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. 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 until terms and conditions of the grazing permit are changed 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 (less than or equal to 20 percent) (Key Species Method) at the end of the active growing season.
14. Riparian stubble height of hydric species may not be equal to or less than 6 inches within lentic riparian areas at the end of the grazing season. 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 (preliminary priority habitat)-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.

2.4 Alternative 4 – Season-based

Under Alternative 4, defined seasons of grazing use would be used as the primary tool 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 to the failure to meet the standards and objectives. Appropriate seasons of grazing use under Alternative 4 would also help ensure that standards and objectives would continue to be met allotment-wide where currently met. Resource issues addressed under Alternative 4 are identified in the 2014 Rangeland Health Assessment and Evaluation Report for the Garat allotment (USDI BLM, 2014b). Appropriate seasons of use would be defined and applied where affected resources are present and with consideration of each resource's resistance to short- and long-term impacts from grazing management practices and resilience for recover from those impacts. Limitations to seasons of use were developed and used to define a grazing rotation for the allotment, which would 1) limit disruption and herbaceous utilization associated with livestock management activities within sage-grouse breeding habitats, 2) provide more frequent year-long rest or deferment of livestock grazing use to a period outside the active growing season for native and introduced perennial bunchgrass species, and 3) limit mid-summer grazing use of riparian areas. Constraints used to develop the grazing schedule are provided in Table ALT-10.

Table ALT-10: Resource based constraints used to develop the Season-based grazing schedule for the Garat allotment under all sub-alternatives of Alternative 4

Resource	Pastures
Sage-grouse	Grazing use no more than 1 year in 3 years during the sage-grouse breeding season (April 15 through June 15) in all pastures
Vegetation and Soils	Grazing use no more than 1 year in 3 years during the active growing season for upland bunchgrass species (May 1 through June 30) in all pastures
Riparian	Grazing use no more than 1 year in 3 years during mid-summer (July 1 to September 15) in pastures containing managed reaches of Piute Creek

All pastures provide preliminary priority habitat (PPH)-sagebrush for sage-grouse, and therefore, livestock grazing would be limited to no more than 1 year in any 3 consecutive years during the breeding season (pre-laying, nesting and early brood-rearing; April 15 through June 15).[31] Livestock grazing during the active growing season (May 1 through July 1) of native perennial bunchgrass species[32] would be limited to no more than 1 year in each 3 consecutive years to improve and maintain the health of native and introduced perennial herbaceous species, as well as to provide vegetative cover and litter deposition for soil protection. Livestock grazing within areas that contain riparian resources associated with Piute Creek would be deferred during mid-summer (July 1and September 15) 2 years of each 3-year period and allow grazing use in no more than 1 year in each 3-year period to avoid livestock concentration and impacts.

Livestock management actions developed in three sub-alternatives of Alternative 4 would be defined to implement the resource-based constraints in Table ALT-10. Under all sub-alternatives, the sage-grouse and vegetation/soils constraints would be applied pasture-wide, because these resources are present pasture-wide in all pastures. Under Alternative 4A, the total acreage of pastures containing riparian resources associated with Piute Creek would be managed with a grazing schedule developed to be consistent with riparian constraints. Under Alternative 4B, livestock management practices (e.g., herding, salt and supplement placement, livestock movement) would constrain access to riparian areas associated with Piute Creek, while allowing the remainder of the affected pastures to be available for grazing use unlimited by the riparian constraint. Under Alternative 4C, the total acreage of pastures containing riparian resources would be managed with a grazing schedule developed to be consistent with those constraints. However, excepted from the riparian constraint under Alternative 4C would be a 0.3-mile portion of Piute Creek in Kimball pasture (pasture 4) between the east fence line of the Piute Creek Enclosure (pasture 8) and the north fence line of Piute Creek pasture (pasture 2) that would be managed as a livestock water-gap.[33]

[31] Breeding season in this instance refers primarily to the peak of the nesting season for sage-grouse as this is the season when current livestock grazing has the most potential to affect sage-grouse reproductive efforts. This period is expected to capture the vast majority of nesting activities by sage-grouse hens and also includes some lekking and early-brood-rearing activities.

[32] 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. The growing season for introduced perennial bunchgrass species is similar to these native species and due to the greater tolerance of many introduced species to grazing impacts would also have their health and vigor maintained or improved with the constraint for vegetation and soils.

[33] The 0.3 mile reach of Piute Creek within Pasture 4 would not have management actions applied to meet the ORMP Riparian-Wetland Areas management objective, nor would it have management actions applied to meet or make significant progress toward meeting the Idaho Standards for Rangeland Health, Standard 2-Riparian Areas and Wetlands.

Under all sub-alternatives of Alternative 4, Piute Camp Enclosure (pasture 7) and Piute Creek Enclosure (pasture 8) would be managed to exclude livestock use at all times (see Maps RNGE-2 and -7).

Under all sub-alternatives of the season-based alternative, BLM would set the stocking rate for the Garat allotment to result in a stocking rate of 10 acres per AUM or less. The stocking rate would be defined by the combined number of cattle and duration of scheduled use (see Appendix D). Ten acres per AUM is a close approximation of the current stocking rates allotment-wide. Current stocking rates were not identified as a cause for failure to meet rangeland health standards or management objective. 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. [34]

Additionally, the existing enclosures at Four Corners Camp and Stateline Camp (Maps RNGE-3, 4, 5, and 6, 8, and 9) would be managed separate from pastures 1 through 6 of the grazing schedules below. Authorization would include saddle horse use within these enclosures by an average of 10 saddle horses and no more than 50 horses, with a maximum of 106 AUMs through the grazing season.

Petan Company of Nevada, Inc., would be offered a grazing permit for a term of 10 years with an active use of 10,350 Animal Unit Months (AUMs), as outlined in Table ALT-11. As a result of the pasture-specific constraints in periods of scheduled use established to improve and maintain sage-grouse habitats, upland perennial vegetation communities, soil resources, and riparian resources adjacent to Piute Creek, the alternative includes the elimination of 9,150 active use AUMs and 3,250 voluntary non-use AUMs from permitted use.[35]

Table ALT-11: Permitted grazing use within the Garat allotment with implementation of all sub-alternatives of Alternative 4 – Season-based

Active Use	Suspension	Permitted Use
10,350 AUMs	10,896	21,246 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-12 and the terms and conditions following the table.

[34] 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, with annual production equal to the representative year identified in NRCS ecological site descriptions and livestock utilization at 50 percent of grass and grass-like species. This stocking rate would be supported, assuming ideal conditions with forage production from all ecological sites at potential, equal livestock distribution throughout the allotment, and forage allocated only to livestock use. 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 (ORMP FEIS Table VEGE-2: Garat allotment: 24 percent early seral, 45 percent mid-seral, and 25 percent late seral). 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. Appropriate seasons of grazing use to meet management objectives limit the full availability of forage in each pasture during some portion of the year and grazing cycle when the pasture cannot be used. In addition, measured utilization is not only the result of that forage grazed by livestock, but includes vegetation removed by native herbivores, including insects, and harvest efficiency, including damage to plants caused by livestock trampling and loafing. Finally, management objectives to sustain multiple resource values in addition to livestock forage production often do not allow opportunity to maximize use of available grass and grass-like production for livestock forage. When compared to a potential stocking rate of 4.8 acres per AUM if the ideal conditions were present in the Garat allotment, active use authorized under the current permit is based on an allotment-wide stocking rate of 10.4 acres per AUM on public land. The allotment-wide stocking rate under all sub-alternatives of Alternative 4 would be 19.6 acres per AUM on public land. Current livestock grazing management practices (primarily inappropriate seasons of livestock use) are significant factors in not meeting Standards 2, 4, and 8 in the Garat allotment.

[35] The elimination of 9,150 AUMs of active use and 3,250 voluntary non-use AUMs will not result in a conversion to suspension AUMs, as this would not be a temporary reduction (see, e.g., 43 CFR § 4100.0-5, Definitions), but a reduction under 43 CFR § 4110.3-2 (b), and as discussed in section 2.7 of this EA .

Table ALT-12: Mandatory and other terms and conditions of the offered permit to graze livestock within the Garat allotment with implementation of all sub-alternatives of Alternative 4 – Season-based

Allotment	Livestock		Grazing Period		% PL[1]	Type Use	AUMs
	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	10/15	100	Active	106

[1] 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 that would be offered under Alternative 4.

Terms and conditions:

1. Grazing use of the Garat allotment (00584) will be in accordance with the grazing schedule identified in the final decision of the Owyhee Field Office Manager dated _____. Flexibility in dates of livestock moves between pastures is provided to meet resource management and livestock management objectives, so long as move dates adhere to seasons of use constraints identified in the decision. Changes to the scheduled use require prior approval by the authorized officer, consistent with standard terms and conditions.
2. Line 2 of the schedule above provides management flexibility for strays at the close of the grazing season; not to exceed 250 head from 10/1 to 10/15.
3. Line 3 of the schedule above provides management flexibility for an average of 15 head of horses through the grazing season within the horse fields located near Stateline Camp and Four Corners Camp. Approximately 10 saddle horses may be kept at one or both of these locations season-long, but not to exceed 75 horses during periods when cattle are being moved between pastures or during branding; not to exceed 106 AUMs.
4. (This term and condition applies only to Alternative 4B) Livestock management practices (e.g. herding, salt and supplement placement, and livestock movement) are required to control the timing and location of grazing use so as to allow for no more than 1 in 3 years of use during mid-summer (7/1 to 9/15) within the riparian areas associated with Piute Creek in pastures 2, 3, and 4. The one year of each three-year cycle year when mid-summer livestock use of riparian areas in pastures 2, 3, and 4 would be allowed would be coordinated annually between BLM and the permittee during turn-out meetings and within the annual schematic..
5. Livestock turnout is subject to Boise District range readiness criteria.
6. You are required to submit a signed and dated Actual Grazing Use Report Form (BLM Form 4130-5) for the allotment you graze. The completed form(s) must be submitted to this office within 15 days from the last day of your authorized annual grazing use.
7. Supplemental feeding is limited to salt, mineral, and/or protein, in block or granular form. If used, supplements must be placed at least one-quarter (1/4) mile away from any riparian area, springs, streams, meadow, aspen stand, playa, special status plant populations, or water development. Use of other supplements on public land requires annual authorization by the authorized officer.
8. Trailing activities must be coordinated with the BLM prior to initiation. A crossing permit may be required prior to trailing livestock across public lands. You must notify any/all affected permittees or landowners in advance of crossing.
9. Livestock exclosures located within your grazing allotment [e.g., Piute Camp Enclosure (Pasture 7) and Piute Creek Enclosure (Pasture 8)] are closed to all domestic grazing use.
10. 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.[36]

11. Bird ladders that meet BLM standards must be installed and functioning on all water troughs on public lands. It is your responsibility to install and maintain all bird ladders. On permanent troughs, you are required to inform the BLM when bird ladders are needed, and the BLM will supply bird ladders. On temporary troughs you are responsible for providing bird ladders.
12. 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.
13. 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.
14. Utilization may not exceed 50 percent of the current year's growth, in accordance with the Owyhee Resource Management Plan.
15. You shall provide reasonable administrative access across private and leased lands to the BLM for the orderly management and protection of the public lands.

Alternative 4A

Under Alternative 4A, the grazing schedule identified in Table ALT-13 would be established for 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-10. The constraints for sage-grouse and vegetation/soils would be applied pasture-wide in all pastures, and would result in limitations to seasons when each of the pastures in the Garat allotment would be available for use. The constraint for riparian resources associated with Piute Creek in pastures 2, 3, and 4 would also be applied pasture-wide

In year 1 of the schedule, flexibility would be provided for cattle to remain in pastures 1 and 2 between 4/16 and 6/30, or for a portion or all of the cattle to be moved to pastures 5 and 6. In all years of the schedule, flexibility after 7/1 would also be provided for use of multiple pastures that do not contain riparian resources and the associated riparian constraint. 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 at least 2 years of each 3-year cycle, scheduled deferment of grazing use outside the upland vegetation active growing season (5/1 to 6/30) is implemented in at least 2 years of each 3-year cycle, and deferment of livestock grazing to a period other than mid-summer (7/1 to 9/15) occurs in pastures 2, 3, and 4 and the associated riparian resources adjacent to Piute Creek in at least 2 years of each 3-year cycle.

Table ALT-13: Garat allotment grazing schedule with implementation of Alternative 4A – Season-based with pasture-wide constraints for riparian resources in pastures 2, 3, and 4

Pasture	Pasture Name	Year 1	Year 2	Year 3
1	Dry Lake[1]	3/15-6/30[2]	3/15-4/15	3/15-4/15
2	Piute Creek[1]			
3	Forty-Five	7/1 to 10/15[2]	Rest	4/16 to 6/30

[36] See section 2.6.5 for a discussion of the BLM process for consideration of access and maintenance requests associated with livestock grazing.

Pasture	Pasture Name	Year 1	Year 2	Year 3
4	Kimball	Rest	4/16 to 6/30	7/1 to 10/15[2]
5	Big Horse[3]	3/15 to 10/15[2]	7/1 to 10/15[2]	7/1 to 10/15[2]
6	Juniper Basin	3/15 to 10/15[2]	7/1 to 10/15[2]	7/1 to 10/15[2]
7 8	Piute Camp Enclosure Piute Creek Enclosure	Livestock Exclusion		
9 10 11	Four Corners West Four Corners East Stateline	Horses and Short-term holding		

[1] 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. Grazing use of these pastures in any year after 7/1 is not scheduled due to limited water available to support livestock use and increasing risk of livestock moving into the Owyhee River Canyon.

[2] 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, upland vegetation growing season deferment, and riparian deferment are provided.

[3] 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.

Alternative 4B

Under Alternative 4B, the grazing schedule identified in Table ALT-14 would be established for the Garat allotment and made a term and condition of the grazing permit. The grazing schedule would implement the constraints identified above in Table ALT-10. The constraints for sage-grouse and vegetation/soils would be applied pasture-wide, because these resources are present pasture-wide in all pastures. The sage-grouse and vegetation/soil constraints would result in limitations to seasons when each of the pastures in the Garat allotment would be available for use. The constraint for riparian resources associated with Piute Creek in pastures 2, 3, and 4 would be applied specific to the location of those riparian resources and would not define seasons when the pastures as a whole containing riparian resources would be available. Meeting the riparian constraints would require the use of livestock management practices (e.g. herding, salt and supplement placement, and livestock movement) to control the timing and location of grazing use consistent with those constraints in Table Alt-10. The term and condition that restricts mid-summer livestock use of riparian areas in pastures 2, 3, and 4 to one year of each 3-year cycle would be coordinated annually between BLM and the permittee during turn-out meetings and within the annual grazing schematic.

Flexibility would be provided for cattle to remain in pastures 1 and 2 between 4/16 and 6/30 in year 1 of the schedule, or for a portion or all of the cattle to be moved to pastures 5 and 6. Flexibility would also be provided within the schedule for use of multiple pastures that do not contain riparian resources and the associated constraint 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 at least 2 years of each 3-year cycle, scheduled deferment of grazing use outside the upland vegetation active growing season (5/1 to

7/1) is implemented in at least 2 years of each 3-year cycle, and livestock management practices are applied so that grazing does not occur within the area of riparian resources of Piute Creek in pastures 2, 3, or 4 during mid-summer (7/1 to 9/15) in at least 2 years of each 3-year cycle consistent with the constraint.

Table ALT-14: Garat allotment grazing schedule with implementation of Alternative 4B – Season-based with required livestock management practices to meet riparian constraints in pastures 2, 3, and 4

Pasture	Pasture Name	Year 1	Year 2	Year 3
1	Dry Lake[1]	3/15-6/30[2]	3/15-4/15	3/15-4/15
2	Piute Creek[1,2]			
3	Forty-Five[2]	7/1 to 10/15[3]	7/1 to 10/15[3]	4/16 to 10/15[3]
4	Kimball[2]	7/1 to 10/15[3]	4/16 to 10/15[3]	7/1 to 10/15[3]
5	Big Horse[4]	3/15 to 10/15[3]	7/1 to 10/15[3]	7/1 to 10/15[3]
6	Juniper Basin	3/15 to 10/15[3]	7/1 to 10/15[3]	7/1 to 10/15[3]
7 8	Piute Camp Enclosure Piute Creek Enclosure	Livestock Exclusion		
9 10 11	Four Corners West Four Corners East Stateline	Horses and Short-term holding		

[1] 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. Grazing use of these pastures in any year after 7/1 is not scheduled due to limited water available to support livestock use and increasing risk of livestock moving into the Owyhee River Canyon.
[2] The permittee would be required to apply livestock management practices (e.g. herding, salt and supplement placement, and livestock movement) to control the timing and location of grazing use so as to allow for no more than 1 in 3 years of use during mid-summer (7/1 to 9/15) within the riparian areas associated with Piute Creek in pastures 2, 3, and 4.
[3] 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, upland vegetation growing season deferment, and riparian deferment are provided.
[4] 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.

Alternative 4C

Under Alternative 4C, the grazing schedule identified in Table ALT-15 would be established for the Garat allotment and made a term and condition of the grazing permit. Actions would be the same as those described under Alternative 4A, except that the 0.3-mile long reach of Piute Creek within pasture 4 would be managed as a water gap and livestock access to this reach would be allowed to provide livestock water.[37] The grazing schedule would implement the constraints identified above in Table ALT-10,

[37] The 0.3-mile reach of Piute Creek within pasture 4 would not have management actions applied to meet the ORMP Riparian-Wetland Areas management objective, nor would it have management actions applied to meet or make significant progress toward meeting the Idaho Standard for Rangeland Health 2 – Riparian Areas and Wetlands.

although the riparian constraint would not apply to the 0.3-mile long reach of Piute Creek in pasture 4 that falls outside the riparian exclosure (pastures 7 and 8). The constraints for sage-grouse and vegetation/soils would be applied pasture-wide in all pastures, and would result in limitations to seasons when each of the pastures in the Garat allotment would be available for use. The constraint for riparian resources associated with Piute Creek in pastures 2 and 3 would also be applied pasture-wide.

Flexibility would be provided for cattle to remain in pastures 1 and 2 between 4/16 and 6/30 in year 1 of the schedule, or for a portion or all of the cattle to be moved to pastures 5 and 6. Flexibility would also be provided within the schedule for use of multiple pastures that do not contain riparian resources and the associated constraint 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 years of each 3-year cycle, 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, and grazing does not occur within riparian resources of Piute Creek in pastures 2 and 3 during mid-summer (7/1 to 9/15) consistent with the constraint.

Table ALT-15: Garat allotment grazing schedule with implementation of Alternative 4C – Season-based with pasture-wide constraints for riparian in pastures 2 and 3

Pasture	Pasture Name	Year 1	Year 2	Year 3
1	Dry Lake[1]	3/15-6/30[2]	3/15-4/15	3/15-4/15
2	Piute Creek[1]			
3	Forty-Five	7/1 to 10/15[2]	Rest	4/16 to 6/30
4	Kimball	7/1 to 10/15[2]	4/16 to 10/15[2]	7/1 to 10/15[2]
5	Big Horse[3]	3/15 to 10/15[2]	7/1 to 10/15[2]	7/1 to 10/15[2]
6	Juniper Basin	3/15 to 10/15[2]	7/1 to 10/15[2]	7/1 to 10/15[2]
7 8	Piute Camp Enclosure Piute Creek Enclosure	Livestock Exclusion		
9 10 11	Four Corners West Four Corners East Stateline	Horses and Short-term holding		

[1] 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. Grazing use of these pastures in any year after 7/1 is not scheduled due to limited water available to support livestock use and increasing risk of livestock moving into the Owyhee River Canyon.

[2] 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, upland vegetation growing season deferment, and riparian deferment are provided.

[3] 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.

2.5 Alternative 5 – No Grazing

Under Alternative 5, no grazing would be authorized on public lands within the Garat allotment for a term of 10 years. Applications for grazing permit renewal would be denied and no grazing permit would be offered. All 33,646 AUMs of permitted use in Garat allotment (19,500 AUMs active use; 3,250 AUMs of voluntary non-use; 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.

2.6 Alternatives Considered but Not Analyzed in Detail

NEPA does not require that all possible alternatives be analyzed in detail. An alternative, including alternatives proposed by the public or another agency, may be eliminated from detailed analysis if:

- The alternative is ineffective (it would not respond to the purpose and need);
- The alternative is technically or economically infeasible (e.g., implementation of the alternative is unlikely given past and current practice and technology);
- The alternative is inconsistent with the basic policy objectives for the management of the area (e.g., not in conformance with the LUP);
- Implementation of the alternative is remote or speculative;
- The alternative is substantially similar in design to an alternative that is analyzed;
- The alternative would have substantially similar effects to an alternative that is analyzed.

2.6.1 Grazing permit renewal with current terms and conditions – No Action

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 detail. 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 that have been recently implemented and 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 existing grazing permit. This was the case with respect to the Garat allotment. For a variety of reasons, actual grazing use on the Garat allotment over the last 10 years was not the same as (and often was substantially less than) the grazing use authorized on the last grazing permit.

This EA analyzes the effects of an alternative (Alternative 1 – Current Situation) that reflects livestock management actions that have actually been implemented over the last 10 years, rather than an alternative that would renew the grazing permits with terms and conditions unchanged (the No Action Alternative). Alternative 1 (Current Situation) provides the baseline for analysis that documents the current and future state of the environment in the absence of action.

2.6.2 Option II of the August 21, 2014, Application for Grazing Permit Renewal

Petan Company of Nevada, Inc., submitted an application for renewal of its grazing permit on August 21, 2014 (Appendix E). Included within that application were two options for grazing use, both of which were identified as the permittee's preferred alternative.[38] Petan's decision to submit two alternatives or options for grazing use was based on the disagreement between BLM and Petan Company regarding the condition of rangelands on the Garat allotment. During consultation regarding the permit renewal, Petan indicated its belief that rangeland conditions on the Garat allotment were good and did not require substantial changes to grazing management. BLM, on the other hand, informed Petan during consultation that BLM resource specialists determined that rangeland conditions on the Garat allotment were not good and needed to be improved by changing grazing use (USDI BLM, 2014b). Based on this disagreement, Petan informed BLM during a meeting in August 2014 that it would submit two alternatives or options.

Petan ultimately submitted Option I as its preferred grazing scheme, based on Petan's assumption that conditions on the allotment are good. Petan submitted Option II, which Petan developed based on BLM's identified resource concerns for the allotment. Option I was largely similar to the revised application received by BLM in February 2013; Option II, on the other hand, included a grazing strategy that incorporated management guidelines similar to management constraints used to develop Alternative 4. The 3-year grazing rotation under Option II included within the application is based on the completion of the Piute Creek and Kimball Division fence improvements.

For this EA, the actions identified in Option I are used to develop and analyze Alternative 2 (Applicant's Proposed Action)[39]. Option II is not analyzed in detail because it would not meet the purpose and need to consider the renewal of the permit to graze livestock within the Garat allotment in a manner that provides 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[40]. Specifically, the seasons and intensities of livestock grazing use proposed under Option II would not provide for progress toward meeting Standard 4 (Native Plant Communities) in pasture 4, would not meet the Owyhee RMP vegetation management objective to improve unsatisfactory vegetation health/condition on all areas, would not provide for progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) for sagebrush-dependent species, and would not meet the Owyhee RMP objectives for wildlife and special status species, as discussed in the vegetation impacts and wildlife impacts subsections that follow.

Some actions proposed under Option II of the permittee's application are considered and analyzed to a limited degree in this subsection. The analysis in this subsection is limited to the number of livestock authorized to graze, active use AUMs, and the grazing schedule with associated flexibility. Other actions proposed under Option II are 1) considered but not analyzed in detail in other subsections of this section (2.1.1), 2) analyzed in detail as part of another alternative, or 3) very similar to those that are analyzed in another alternative. Actions proposed under Option II that are analyzed in other sections are as follow:

- Range readiness criteria prior to turnout, Section 2.6.4
- Motorized and mechanized use within designated Wilderness, Section 2.6.5
- After-the-fact billing, Section 2.2 footnote
- Grazing outside parameters (terms and conditions) of the permit, Section 2.2 footnote
- Rangeland projects on state land, Section 2.2 footnote

[38] In essence, Petan Company submitted two separate alternatives that it wanted BLM to consider.
[39] See section 2.2 of this EA for the actions analyzed under Alternative 2 (Applicants' Proposed Action)
[40] Alternative 2 – Permittee's Proposed Action (Application Option I) also fails to meet the purpose and need to renew the grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. Option I was analyzed in detail in this EA to document the consequences of implementing livestock management practices proposed by the permittee to meet objectives and the standards.

- Piute Creek fence improvements, Section 2.6.3
- Kimball Division fence improvements, Section 2.6.3
- Additional undefined range projects, Section 2.6.3
- Middle Windmill and 45 Windmill well drilling, pipelines, and additional troughs, Section 2.6.3

Vegetation impacts – Option II

Option II of the permittee's application includes a grazing strategy that incorporates guidelines that avoid grazing in pastures 1, 2, 4E, 5, and 6 between 4/16 and 6/15 (identified by the permittee as sage-grouse breeding season) in two years of each 3-yearcycle of the grazing rotation. Similarly, Option II incorporates guidelines that avoid grazing in pastures 3 and 4W between 5/1 and 6/10 (identified by the permittee as critical growing season for bluebunch wheatgrass) more than two years of each three-year grazing rotation. These guidelines are similar to constraints used to develop Alternative 4, but are less restrictive than under Alternative 4. Constraints used to define the grazing schedule under Alternative 4 are based on seasons of grazing use and frequency of use during the defined critical growing season for deep-rooted bunchgrass species. The constraints under Alternative 4 limit grazing use to no more than one year of each three-year grazing rotation between 4/1 and 6/30 (Appendix H). A number of sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season to limit impacts to health and vigor, with some concluding that at least 2 years of deferment for every year of active growing season use should be provided (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., 1991) (Miller, Seufert, & Haferkamp, 1994) (USDA NRCS, 2012). Ganskopp (1988) found a similar response to defoliation of Thurber's needlegrass during the active growing season.

Analysis of the consequences of implementing Alternative 4 for upland vegetation resources concluded that the health and vigor of native deep-rooted perennial bunchgrasses, primarily bluebunch wheatgrass, would improve and as a result, progress toward meeting Standard 4 in pasture 4 would be made. Similarly, analysis of Alternative 4 concluded that progress toward meeting the ORMP vegetation management objective to improve unsatisfactory vegetation health/condition would also be met. Grazing use earlier in the growing season (with a beginning date of 6/10 or 6/15 under Option II as compared to 6/30 under Alternative 4) and more frequent use (2 years of each 3-year cycle in some pastures under Option II as compared to 1 year of each 3-year cycle under Alternative 4), especially in the absence of meaningful limitations to the intensity of grazing use[41], would not allow recovery and maintenance of the health and vigor of native deep-rooted perennial bunchgrasses. This is especially true when considering that the most critical period of bunchgrass growth is the boot-stage when flowering begins to occur and impacts from grazing are greatest. Table VEG-1 in Appendix H identifies the typical timing of flowering for bluebunch wheatgrass at around 4,700 feet elevation is mid- to late June, a time when Option II would allow frequent grazing to occur in spring use pastures. Although the guidelines limiting seasons of use within the pastures managed for sage-grouse breeding habitat under Option II suggest more restriction than for pastures managed only for the critical growing season for bluebunch wheatgrass, they too would allow frequent use during the later flowering stage of growth. Option II would also allow 10 days of flexibility from scheduled use dates for orderly movement of cattle, adding to opportunity for frequent growing-season use and the failure to meet Standard 4 and the ORMP vegetation management objective.

In addition, Option II proposes an initial (years 1-3 of the permit) stocking rate of 10 acres per AUM allotment-wide[42] during the full 7 months of the grazing season. However, the acreage of pastures

[41] The grazing strategy under Option II limits average utilization in each pasture each year to no more than 40 percent through 6/15. Appendix H (Range Ecology / Seasons and Intensities of Grazing Use) concludes that 40 percent utilization is generally considered to be moderate use. Limiting growing season use to no more than 40 percent would not compensate for frequent grazing use during the growing season.

[42] Option II of the application identified that during years 0-3 of the 10-year permit with the initial increase in active use, authorized active use would be 20,261 AUMs on 202,618 acres of public land in the allotment, or 10 acres per AUM. When one subtracts 3,163 AUMs to support

available for the 6-month period after one month of early-season use of pastures 1 and 2 in 2 years of each 3-year period of the grazing rotation, and elimination of public land acreage within the poorly watered pasture 5[43] results in pastures 3, 4W, 4E, and 6 stocked at 7.6 acres per AUM[44]. Option II also proposes a stocking rate of 8.9 acres per AUM allotment-wide[45] in years 4-10 of the permit, when active use would be increased to 22,748 AUMs, or a stocking rate of 6.8 acres per AUM in pastures 3, 4W, 4E, and 6 during the 6 months when these pastures would need to support all planned cattle use.

If BLM was to implement actions to maximize livestock use of forage production, approximately 4.8 acres would be required to support one AUM in the Garat allotment, with annual production equal to the representative year identified in NRCS ecological site descriptions and livestock utilization at 50 percent of grass and grass-like species. This stocking rate could be supported, if one were to assume ideal conditions with forage production from all ecological sites at potential, equal livestock distribution throughout the allotment, and forage allocated only to livestock use. 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 (ORMP FEIS Table VEG-2: Garat allotment: 24 percent early seral, 45 percent mid-seral, and 25 percent late seral). Livestock are not distributed evenly across the allotment or within any pasture. Because of topography, distances from water, and other natural factors, 50 percent utilization in all portions of each pasture does not occur. Appropriate seasons of grazing use to meet management objectives limit the full availability of forage in each pasture during some portion of the year and grazing cycle when the pasture cannot be used. Measured utilization is not only the result of that forage grazed by livestock, but also includes harvest efficiency (damage to plants caused by livestock trampling and loafing) and vegetation removed by native herbivores, including insects. Finally, management objectives to sustain multiple resource values in addition to livestock forage production often do not allow opportunity to maximize use of available grass and grass-like production for livestock forage. Option II also includes a limitation on average utilization in each pasture each year to no more than 40 percent through 6/15, further limiting the portion of total production of grass and grass-like species that may be available for livestock production.

The allotment-wide stocking rate for the allotment under the expiring permit has been 10.4 acres per AUM. Average actual use of 14,802 AUM during the 10-year period between 2002 and 2011 has resulted in 13.7 acres per AUM. Standards 2, 4, and 8 have not been met due to current livestock management practices under these stocking rates (Appendix F). Compared to a potential stocking rate of 4.8 acres per AUM if the ideal conditions were present in the Garat allotment and actual stocking rates between 10.4 and 13.7 in recent years, planned grazing in years 1 through 3 under Option II is not sustainable and would not allow progress toward meeting standards because it requires 7.6 acres per AUM during the 6-month portion of the grazing season when pastures 3, 4, and 6 are scheduled for use through 2 of each 3 years of the grazing schedule and 6.3 acres per AUM during the remaining year when pastures 1 and 2 are rested. Additionally, the number of acres per AUM would decrease to 6.8 in these pastures during years

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3,163 cattle during one month between 3/15 and 4/14 when pastures 1 and 2 are scheduled for use in 2 years of the 3-year schedule, 129,219 acres of public land in pastures 3, 4W, 4E, and 6 would need to support 17,098 AUMs or 7.6 acres per AUM.

[43] Pasture 5 contains very limited livestock water and thus cannot be depended on to provide forage on a regular basis, especially after the earlier portions of the grazing season.

[44] Pastures 3, 4, and 6 contain 129,219 acres of public land and would be required to support 17,042 AUMs during years 0-3 of the permit (7.6 acres per AUM), while 3,024 AUMs of use would be scheduled in pastures 1 and 2 during one month between 3/15 and 4/14 in 2 years of each 3 years of the grazing schedule, and 177 AUMs would be scheduled for horse use in Stateline Camp and Four Corners Camp.

[45] Option II also identifies an increase to 22,748 AUMs of active use in years 4-10 of the permit. When one calculates the stocking rate on 202,618 acres of public land in the allotment, 8.9 acres per AUM would be needed to support 3,557 head of cattle. When one subtracts 3,557 AUMs to support 3,557 head of cattle during one month between 3/15 and 4/14 when pastures 1 and 2 are scheduled for use in 2 years of the 3-year schedule and 177 AUMs scheduled for horse use in Stateline Camp and Four Corners Camp, 129,219 acres of public land in pastures 3, 4W, 4E, and 6 would need to support 19,014 AUMs or 6.8 acres per AUM.

4-10 in 2 of each 3 years of the grazing schedule and 5.7 in the remaining year when pastures 1 and 2 are rested under Option II.[46]

Given the frequency of critical growing season use and the intensity of grazing use (fewer than 10 acres per AUM) on a major portion of the allotment, Option II of the permittee's application would not allow progress toward meeting Standard 4 in pasture 4, nor would it allow the ORMP vegetation management objective to be met. Thus, implementation of Option II would not constitute a grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and therefore does not meet the purpose and need. Option II is not analyzed in greater detail.

Wildlife Impacts – Option II

Option II proposes increasing active AUMs well above the level of grazing that has resulted in the current situation. In addition, it proposes implementing a rotation grazing system in which livestock would be concentrated in fewer pastures at a time compared to the current situation. Option II also proposes grazing pasture 3 and a new proposed pasture 4W during the portions of the sage-grouse breeding season every year. It would also allow frequent grazing in pastures 4E, 4W, and 6 when deep-rooted bunchgrasses are in or near the boot stage, which is when they are most sensitive to grazing.

The Garat allotment is not meeting Standard 8 and current livestock grazing practices are a causal factor. Further concentrating livestock and continuing to graze the same pastures during times when both wildlife and upland plants are most sensitive would not allow the allotment to make progress towards meeting Standard 8. Grazing pressure on deep-rooted bunchgrasses that are already declining in pasture 4 would not be reduced adequately to allow for recovery of vigor and an increase in abundance that is necessary to provide the necessary screening cover for sage-grouse nests and broods. Implementation of Option II would not make progress towards meeting Standard 8 and the ORMP objectives for wildlife and special status species.

Between 2003 and 2013, an average of 12,401 AUMs have been used by livestock on the allotment, with a maximum in that period of 18,870 in 2006 and a minimum of 8,749 AUMs in 2012. The permittee has apparently taken a conservative approach in the past by not attempting to utilize all of their authorized AUMs. However, even with these efforts, the allotment is not meeting rangeland health standards and current livestock management practices are a causal factor. Based on the findings of the BLM's 2014 RHA (USDI BLM, 2014b), further actions are necessary beyond the use of fewer-than-maximum AUMs each year, to allow the allotment to make progress towards meeting Standard 8 and the ORMP objectives for wildlife and special status species.

In addition to the allotment failing to Standards 4 or 8 under Option II, features of this option have already been analyzed in detail under other alternatives including:

- The management guideline under Option II that constrains grazing within PPH for sage-grouse between 4/16 and 6/15 (the breeding season) more than once every 3 years is the same as the

[46] Option II of the application identifies that 22,748 AUMs would be authorized in years 4-10 of the renewed permit, consistent with the 22,750 AUM active permitted use specified by the approved Owyhee Resource Management Plan. Table LVST-1 in the Owyhee Resource Management Plan lists 22,750 AUMs of active permitted use within the Garat allotment at the time of implementation of the plan, 1999. The plan also states under Management Actions and Allocations #1 for Livestock Grazing Management, "Allocate 135,116 AUMs for livestock…as shown in Table LVST-1 for livestock… The livestock allocation is the current active permitted use for livestock in the Owyhee Resource Area. In order to meet resource objectives, the forage allocation will be adjusted based upon monitoring and assessment. Evaluation of monitoring data will determine future stocking levels. Stocking levels necessary to meet objectives are projected to be approximately 112,649 AUMs in 5 years and approximately 105,899 AUMs in 20 years. The average actual grazing use has been 96,676 AUMs from 1988-1997."

constraint applied for sage-grouse in Alternative 4 (EA Section 2.4). However under Alternative 4, the constraint was applied to every pasture, whereas Option II does not apply the constraint to pasture 3 and the proposed pasture 4W, both of which are comprised of PPH. In Alternative 4, this constraint is coupled with a decrease in AUMs, which would reduce the effects of concentrating livestock into a single pasture during the rotation, which would not happen under Option II.

- The proposed increase in AUMs is consistent with what is proposed and analyzed under Alternative 2.
- The proposed utilization limits of 40 percent at the end of the growing season and 50 percent maximum are higher than what is analyzed under Alternative 3, but the analysis would be sufficient to inform the decision maker on the impacts of the proposed limits in Option II.
- The proposed 10 days of flexibility for move dates are analyzed under Alternative 2.

Summary – Option II

After considering the rationale stated above, Option II is not analyzed in detail, because it would not meet the purpose and need to consider the renewal of the permit to graze livestock within the Garat allotment in a manner that provides 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. Specifically, the seasons and intensities of livestock grazing use proposed under Option II would not provide for progress toward meeting Standard 4 (Native Plant Communities) in pasture 4, would not meet the Owyhee RMP vegetation management objective to improve unsatisfactory vegetation health/condition on all areas, would not provide for progress toward meeting Standard 8 (Threatened and Endangered Plants and Animals) for sagebrush-dependent species, and would not meet the Owyhee RMP objectives for wildlife and special status species, as discussed in the vegetation impacts and wildlife impacts subsections that follow.

2.6.3 New Rangeland Projects

The application for permit renewal received from Petan Company of Nevada, Inc., in August 2014 identifies rangeland improvement projects (fencing and water developments) under both Option I and Option II that would modify existing projects or propose the construction of new projects (Appendix E). In addition, Option II identified the construction of the Kimball division fence improvement that is addressed above under Section 2.6.2 discussing Option II. Though rangeland projects are one of a number of tools available to meet rangeland health standards and/or resource objectives[47], BLM considered, but did not analyze in detail, each of the projects proposed for the following reasons:

- BLM defined the action in the Section 1.4 (Purpose and Need) as the renewal of a grazing permit using existing infrastructure on the allotment at issue, and thus requests to build new infrastructure do not meet the purpose and need for this action. The BLM decided to rely on means other than additional project construction to improve rangeland health and meet RMP objectives in this permit renewal process, including varying the seasons of use for grazing, adjusting the timing and intensity of use, and also by considering adjustments to stocking rates.

[47] The Idaho S&Gs identify the role of grazing management practices and livestock management facilities in meeting rangeland health standards. Page 8 of the Idaho S&Gs states, "Grazing management practices are livestock management techniques. They include the manipulation of season, duration (time), and intensity of use, as well as numbers, distribution, and kind of livestock. Livestock management facilities are structures such as fences, corrals, and water developments (ponds, springs, pipelines, troughs, etc.) used to facilitate the application of grazing management practices." As such, projects in the absence of associated grazing management practices do not meet the purpose and need to renew the grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

- The Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management include guidelines that direct the selection of grazing management practices, and where appropriate, livestock management facilities to promote significant progress toward, or the attainment and maintenance of, the standards. Any livestock management facilities that do not directly facilitate the application of grazing management practices to manipulate the season, duration (time), and intensity of use, as well as the number, distribution, and kind of livestock, are not consistent with the purpose and need for actions to renew the grazing permit in a manner that meets the standards and objectives.
- Although the Owyhee Resource Management Plan recognizes that rangeland projects have the potential to assist BLM in meeting management objectives in some situations, the ORMP states:

  > *Use a minimal level of rangeland developments (e.g., fences, water facilities) to adjust livestock grazing practices to achieve multiple use resource objectives and meet standards for rangeland health" (ORMP/ROD at 24).*

  A variety and considerable number of range improvement projects such as spring developments, fences, reservoirs, storage tanks, and troughs have already been constructed across the allotment to aid in livestock grazing management. Table LVST-4 of the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement identified 62 reservoirs, four wells, and 55 pasture fences within the Garat allotment in 1999. Despite the considerable developments and infrastructure already on the Garat allotment, the allotment is still struggling to meet standards and resource objectives indicating a need to take a hard look at number of livestock and intensities of use.
- The BLM is preparing an RMP-amending environmental impact statement that considers alternative strategies to protect greater sage-grouse in Idaho and southwestern Montana. Consequently, the Owyhee Field Office is reluctant to analyze and approve new range improvement projects in sage-grouse habitat pending the adoption of the land use plan amendment that may define limitations and opportunities for additional infrastructure development.[48] The Garat allotment encompasses large and contiguous areas of sage-grouse PPH. Analysis and approval of new infrastructure on the Garat allotment before completion of the sage-grouse RMP amendments could limit the options available to the decision maker on the sage-grouse RMP amendments. Indeed, some alternatives being considered as part of the sage-grouse RMP amendment process and EIS include restricting or precluding altogether new infrastructure.
- BLM Washington Office Instruction Memorandum 2012-043 provides interim conservation policies and procedures to the field offices to be applied to ongoing and proposed authorizations and activities that affect greater sage-grouse and its habitats while the sub-regional RMP

[48] 2005 BLM Land Use Planning Handbook, Status of Existing Decisions During the Amendment or Revision Process: During [a land use plan] amendment or revision process, the BLM should review all proposed implementation actions through the NEPA process to determine whether approval of a proposed action would harm resource values so as to limit the choice of reasonable alternative actions relative to the land use plan decisions being reexamined. Even though the current land use plan may allow an action, the BLM manager has the discretion to defer or modify proposed implementation-level actions and require appropriate conditions of approval, stipulations, relocations, or redesigns to reduce the effect of the action on the values being considered through the amendment or revision process. The appropriate modification to the proposed action is subject to valid existing rights and program-specific regulations. A decision to temporarily defer an action could be made where a different land use or allocation is currently being considered in the preferred alternative of a draft or proposed RMP revision or amendment. These decisions would be specific to individual projects or activities and must not lead to an area-wide moratorium on certain activities during the planning process. (BLM Land Use Planning Handbook H-1601-1 at 47)

amendment process is underway. The guidance is in effect until the BLM develops and decides how to best incorporate long-term conservation measures for greater sage-grouse into applicable land use plans. Proposed fences are addressed with the following guidance:

> *Evaluate the need for proposed fences, especially those within 1.25 miles of leks that have been active within the past 5 years and in movement corridors between leks and roost locations. Consider deferring fence construction unless the objective is to benefit Greater Sage-Grouse habitat, improve land health, promote successful reclamation, protect human health and safety, or provide resource protection. ---*

Similarly, water developments are addressed with the following guidance:

> *NEPA analysis for all water developments must assess impacts to Greater Sage-Grouse and its habitat. Install escape ramps and a mechanism such as a float or shut-off valve to control the flow of water in tanks and troughs. Design structures in a manner that minimizes potential for production of mosquitos which may carry West Nile virus.*

The complexity and uncertainty of considering and analyzing proposed projects in the context of the Garat allotment grazing permit renewal is heightened because long-term conservation measures for greater sage-grouse in the amendments to the ORMP have not been identified. However, the BLM does expect that a record of decision for the sage-grouse amendments will be issued sometime in 2015. In this situation, the BLM concludes it is more prudent to defer consideration of range improvements within sage-grouse habitat until those amendments are finalized.

- BLM's regulations for grazing administration specific to the standards and guidelines (43 CFR 4180.2) require that the authorized BLM officer, upon determining existing grazing management practices or levels of grazing use on public lands are significant factors in failing to achieve the standards and conform with the guidelines, take appropriate action as soon as practicable but not later than the start of the next grazing year. Considering the time required for project design, completion of site specific surveys[49] and NEPA analysis, plus the construction time associated with any surface disturbing activities, it is unlikely that the authorized officer could take the required appropriate action prior to the start of the next grazing year on the Garat allotment. In other words, given the limited time BLM has to modify grazing under the regulations (i.e., before the start of the next grazing season), new infrastructure as a means to meet that obligation is infeasible given the lengthy time commitment required to consider, implement, and build such infrastructure. It would be most likely that these projects could not be completed within the limited time, and would therefore require interim actions to be taken while projects were still in various stages of survey, analysis, and construction. Even these interim actions could require another layer of NEPA analysis before implementation, further delaying progress toward improving rangeland conditions consistent with timeframes established in 43 CFR 4180.

[49] BLM completes site-specific surveys to identify the possible presence of resource values prior to project construction. Those surveyed resource values include archeological and cultural resources, special status plants and animals, and other resource values as applicable. Impacts resulting from site disturbing activities associated with project construction and alteration of types and patterns of resource uses can then be identified and needed mitigation actions considered to avoid unacceptable impacts. Construction of project would not be an option when the opportunity does not exist to construct a project in a manner that avoids unacceptable impacts to resource values, even with implementation of mitigation actions.

Projects Proposed in the Application

The BLM did not analyze the project proposed by Petan Company of Nevada, Inc. to re-drill the livestock water wells known as Middle Windmill (T.16S., R.3W., Sec 9) and 45 Windmill (also known as North Well; T.15S., R.3W., Sec 20) because these two wells are current projects authorized and constructed through cooperative agreements that require the cooperator (Petan Company) to repair and maintain the improvements in good and serviceable condition following their completion. Maintenance of these projects consistent with the original design and within the existing foot-print is the responsibility of Petan Company. New pipelines serviced by these wells to new troughs at lower elevation portions of the Big Horse Pasture were not analyzed, because pending maintenance of the wells in functioning condition and either well's ability to provide livestock water at the site of the well as designed, any pipeline distribution system to troughs distant from the well cannot be supported. In addition, the undefined length of pipeline, location of pipeline, number of troughs, and location of troughs does not allow analysis of the impacts to resource values that may be present. Finally, the complexity and uncertainty of considering and analyzing proposed projects during grazing permit renewal is heightened pending the identification of long-term conservation measures for greater sage-grouse in the yet-to-be completed amendment to the ORMP. The pipelines have limited application to facilitate the grazing management practices that were proposed by the permittee to meet the Idaho S&Gs or the ORMP management objectives.

The BLM did not analyze proposed restoration, improvement, or development of existing or additional livestock water sources as requested in Options I and II of the August 2014 application for grazing permit renewal. These water developments and their locations were not identified with the detail needed to complete inventories and surveys that are required to fully and appropriately analyze and disclose the direct, indirect, and cumulative impacts associated with new or modified infrastructure projects. In the absence of sufficient site-specific information (locations, engineering specifications, etc.) for BLM to fully analyze the proposed projects, these livestock watering projects were not included in Alternative 2, the applicant's proposal (Option I). In the absence of information regarding the number, types, and location of projects, the restoration, improvement, or development of existing or additional livestock water sources in spring-use pastures does not meet the purpose and need to renew the grazing permit. These unidentified projects do not facilitate the application of the grazing management practices proposed by the permittee to make progress toward meeting the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management or to meet Owyhee RMP objectives.

The BLM did not analyze the maintenance of two existing wells in pasture 5 as a part of the permit renewal process or the new pipelines and troughs proposed by the permittee from one or both of these wells. While maintenance of the two inoperable wells and windmills to provide livestock water at troughs located near the wells as designed is a part of the maintenance responsibility assigned to the permittee, pipelines from these wells and additional troughs located distant from the wells would require analysis and authorization consistent with the ORMP objective to use a minimal level of rangeland developments to adjust livestock grazing practices to achieve multiple use resource objectives and meet standards for rangeland health. A reliable source of water from the wells would also be necessary before developing plans to distribute water through new pipelines to new troughs. Although additional livestock water locations resulting from new pipeline construction and additional trough placement may facilitate livestock management in general and may provide greater opportunity for use of pasture 5, the pipelines and troughs do not facilitate the application of the grazing management practices proposed by the permittee to make progress toward meeting the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management or to meet Owyhee RMP objectives. Additionally, in the absence of information regarding the locations and lengths of pipeline proposed and trough locations, detailed analysis cannot be completed. Because the proposed pipelines and troughs do not meet the purpose and need to consider the renewal of the permit to graze livestock within the Garat allotment with the existing infrastructure and in a manner that provides for livestock grazing opportunities on public lands where

consistent with meeting management objectives, these projects were not analyzed in detail. BLM may consider and analyze any of these presently undefined projects relative to the ORMP management action to use a minimum level of rangeland developments, but outside the permit renewal process.

The BLM did not analyze in detail the modification of the cross-fence layout in the Piute Creek/Piute Basin area. The proposed fence modification, included in both Option I and Option II, would entail the construction of proposed new fence and removal of existing fence to enclose a water-lot at Piute Basin Reservoir. Relocating the fence-line boundary would result in all reaches of Piute Creek down-slope from Piute Basin Reservoir being located within pasture 2 (see Map 1 in both Option I and Option II; Appendix E). The location of proposed fence construction and removal is within sage-grouse Preliminary Priority Habitat (PPH).[50] Current interim guidance is to evaluate the need for proposed fences, especially those within 1.25 miles of leks that have been active within the past 5 years and in movement corridors between leks and roost locations.[51] Interim guidance also suggests deferring fence construction unless the objective is to benefit greater sage-grouse habitat, improve land health, promote successful reclamation, protect human health and safety, or provide resource protection. BLM elected to defer analysis of the construction of the proposed fence pending the identification of long-term conservation measures for greater sage-grouse in the amendment to the Owyhee Resource Management Plan. Although construction of the proposed redesign and revision to fence layout in the Piute Creek/Piute Basin area may be consistent with the management actions of the ORMP upon completion of the amendments, analysis of compliance with the future RMP management objectives for sage-grouse and its habitats is premature.

The BLM did not analyze in detail the division fence proposed for pasture 4 under the permittee's Option II because the option as a whole did not implement grazing management practices that would allow progress toward meeting Standards 4 and 8, as identified above in Section 2.6.2. In the absence of grazing management practices that meet the purpose and need, detailed analysis of projects associated with Option II was not completed. The projects in and of themselves, and in the absence of facilitating the application of grazing management practices, do not meet the purpose and need to renew the grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

In addition, the grazing management practices associated with modification of the cross-fence layout in the Piute Creek/Piute Basin area under Option I would result in annual grazing of the riparian resources adjacent to Piute Creek between 3/15 and 6/30, a season of use that is analyzed in both Alternatives 1 and 2. That analysis concluded that impacts to riparian resources would not allow objectives to be met and thus the alternatives would not meet the purpose and need to renew the grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. This failure to meet riparian objectives and thus the purpose and need would increase with the proposed phased increase in livestock numbers and AUMs over the 10-year term of the permit. While the grazing schedule related to modification of the cross-fence layout in the Piute Creek/Piute Basin area under Option II would shorten the period of grazing use in riparian resources with the scheduled one month between 3/15 and 4/15 in 2 years of each 3-year cycle and rest in the third year,

[50] Construction of fences can have resulted in habitat loss and fragmentation (Braun 1998 in Connelly et al 2000). Fences pose a hazard to sage-grouse because they provide additional perch sites for raptors and because sage-grouse may be killed or injured when they fly into them (Call and Maser 1985 in Connelly et al 2000). Approximately 36,690 miles of fence were constructed on BLM lands supporting sage-grouse between 1962 and 1997 (Connelly et al. 2000). The USFWS identified fences as a threat to sage-grouse with the potential to cause direct mortality, facilitate mortality from raptors, and to fragment habitats since sage-grouse avoid fences (USDI 2010). The USFWS stated that habitat fragmentation from infrastructure including power lines, roads, communication towers, and fences is a primary cause of sage-grouse declines (USDI 2010).

[51] BLM Washington Office Instruction Memorandum 2012-043 provides interim conservation policies and procedures to the field offices to be applied to ongoing and proposed authorizations and activities that affect greater sage-grouse and its habitats while the sub-regional RMP amendment process is underway.

Option II as a whole would not meet the purpose and need (see above analysis of Option II). Option II fails to allow progress toward meeting Standards 4 or 8 that were not met due to current livestock management practices. Because Option II does not meet the purpose and need due to the associated livestock management practices that will not allow progress toward meeting standards, the reconstruction of fencing in the vicinity of Piute Creek was not analyzed in detail independently. Detailed analysis of the fence, in the absence of consideration of how livestock management practices would be facilitated by the fence, does not meet the purpose and need to renew the grazing permit consistent with meeting management objectives, including the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

Finally, 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 be included in the Garat allotment EA, these steps would postpone taking appropriate action to make progress toward meeting standards and would require more complex and uncertain interim actions that would allow progress toward meeting standards pending project implementation.

None of the alternatives analyzed in detail in this NEPA document for grazing permit renewal are dependent on new project construction in order to facilitate the application of livestock management practices of the alternative (e.g., pasture rotation schedules). As a result, no new project construction or reconstruction is analyzed in detail within any alternative of this NEPA document. Although BLM excluded range improvements from this permit renewal process for the above reasons, that exclusion is not intended to preclude proposals for range improvement projects that directly address rangeland health standards, ORMP objectives, or issues relating to protection of BLM sensitive species such as sage-grouse, when the causal factor is something other than the current livestock management practices. Those proposals are independent from the grazing permit renewal process. Similarly, the lack of analysis of range projects in this EA is not intended to preclude proposals for projects that are related primarily to enhancing livestock grazing opportunities on public land. The BLM has the flexibility to consider applications for range improvement projects that enhance livestock grazing opportunities consistent with meeting resource management objectives outside the current permit renewal process.

2.6.4 Range Readiness Criteria

The application for grazing permit renewal received from the permittee on August 21, 2014, included a term and condition of the permit identifying range readiness criteria for livestock turnout that differ from the Boise District Range Readiness Criteria. Because the Boise District range readiness criteria are a consistent administrative tool applied to all permits within the district, individual criteria for the Garat allotment, and also for other allotments, would result in complexity of administering public land grazing in Boise District and detract from the orderly administration of public rangelands. The authorized officer may specify in grazing permits other terms and conditions which assist in the orderly administration of public rangelands (43 CFR § 4130.3-2). To avoid that added complexity, the range readiness criteria proposed by the permittee were not analyzed in detail.

2.6.5 Motorized and Mechanized Use in Designated Wilderness

A term and condition of the proposed actions under both Option I and Option II of the permittee's application for permit renewal (Appendix E) would authorize the permittee's placement of salt and to access and maintain range improvements within the Owyhee River Wilderness areas located in the Garat allotment with motorized vehicles and equipment consistent with the management the permittee practiced in such areas prior to their designation as wilderness.

The Wilderness Act of 1964, the Omnibus Public Land Management Act of 2009, and the Congressional Grazing Guidelines (Appendix A of House Report 101-405) provide the legislative intent and guidance regarding the use of motorized and mechanized equipment in the wilderness. Section 2 of the Congressional Grazing Guidelines states that maintenance of range-related facilities existing in an area prior to wilderness designation (i.e., fences, line cabins, water wells and lines, stock tanks, etc.) is permissible in wilderness. Where practical alternatives do not exist, maintenance or other activities may be accomplished through the occasional use of motorized equipment. The BLM uses the Minimum Requirements Analysis set out in its Wilderness Handbook (H-6340, 2012), to consider access and maintenance requests associated with livestock grazing.

The permittee's proposal describes seven fences and five reservoirs that were accessed via motorized vehicles, or require motorized equipment (e.g., bulldozer) to maintain. The proposal anticipates that motorized access or maintenance intervals will vary, from approximately three times a year to up to 56 times a year. In addition, the permittee's proposal continues the temporary corral set-up and branding area at Reservoir 14/Jackrabbit Reservoir that were used prior to the wilderness designation. The permittee's proposal to continue motorized wilderness access at the level practiced prior to wilderness designation does not meet the Congressional Grazing Guideline's definition of "occasional use", and as such is not analyzed in detail in this NEPA document.

The issue of motorized wilderness access is moot in regards to the No Grazing Alternative, since under this alternative, livestock grazing would no longer occur, thereby negating the need for salt delivery and range project maintenance.

Alternatives 3 (Performance-based) and 4 (Season-based) include provisions for some level of motorized wilderness access for salt delivery and project maintenance and repair. The purpose for the access, the specific access route(s), the seasonality of access, and the frequency of access needed would be evaluated before issuing terms and conditions for activities within wilderness. The terms and conditions authorized within these alternatives would be considered the minimum tools necessary to meet the legislative intent of occasional access, and would best meet the legislative intent of minimizing any associated effects to wilderness character.

2.6.6 Management Alternatives

The following additional management alternatives were submitted to BLM in response to scoping for the Group 1 (Owyhee River) Grazing Permit Renewal EA by WWP in April 2012, for consideration during development of the 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 the Garat allotment lands (South Fork Owyhee watershed) and other areas.

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 the 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, an area outside the Garat allotment, 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 amendments 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 about 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 Garat 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 projects that do not facilitate the application of grazing management practices within any alternative analyzed and therefore is not within the action's purpose and need. In addition, 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 be included in the Garat allotment EA,

these steps would postpone taking appropriate action to make progress toward meeting standards and would require more complex and uncertain interim actions pending project implementation.

2.6.7 Wildfire Fuels

A number of comments (eight submissions and 19 comments) received by the BLM upon public review of the preliminary Group 1 EA in September 2012 identified the failure to identify the perceived benefit of removal of wildfire fuels as a result of livestock grazing. Comments specifically identified the additional fine fuels that would accumulate with reductions in the level of livestock grazing.

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 relationship 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).

Launchbaugh and Walker (2006) described targeted grazing as the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals. They went on to describe the major difference between good grazing management and targeted grazing as targeted grazing refocusing outputs of grazing from livestock production to vegetation and landscape enhancement.

Recent application of targeted grazing has included control of noxious weeds, control of competing vegetation in agroforestry, and the establishment and maintenance of fuel breaks that have little or no vegetation. Targeted grazing is one of a number of tools available for constructing desirable ecosystems. Similar to the use of targeted grazing to meet agroforestry objectives by reducing the health, vigor, and competitive ability of herbaceous and shrub species to benefit timber production, targeted grazing to meet fuels management objectives often does not include actions that maintain or improve health and vigor of rangeland plant communities. Targeted grazing should be used in combination with other technologies to meet vegetation management objectives, with consideration for economic, ecological, and social implications.

However, 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, are often needed to increases livestock consumption of shrubs (Taylor, Jr., 2006).

Additional sources 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 (USDI USGS, 2008) (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. When the cumulative effects of additional vegetation that becomes fine fuels for wildfire as a result of reductions in active grazing use within the Owyhee Field Office implemented between 2012 and 2014 are considered, fire behavior will be little changed with the difference between fire models for the rate of spread in low fuel load and moderate fuel load for grass fuel types and grass/shrub fuel types. These models identify that the rate of spread for fire differs most at the extremes of fuel moisture and wind speed (USDA USFS, 2005). A large number of wildfires in the Great Basin, including the Owyhee Uplands, occur under extreme conditions resulting from the combined high temperatures, low relative humidity, and low fuel moisture during mid to late-summer.

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 analyzed in detail.

These conclusions regarding the level and timing of grazing necessary to limit wildfire behavior with long-term or annual grazing practices are consistent with the review of available literature provided by Strand and others (2014). Long-term grazing management practices necessary to maintain and improve native sagebrush steppe vegetation do not allow removal of adequate fine fuels to significantly alter fire behavior during frequent extreme conditions in the Great Basin with high temperatures, low relative humidity, and low fuel moisture. The timing and intensity of most grazing that would reduce fine fuels prior to the fire season would require annual or frequent grazing at moderate or greater utilization levels during the period of active growth of these perennial herbaceous species when they are impacted the greatest by grazing. Landscape scale or targeted grazing that strategically establishes and maintains fuels breaks is not consistent with meeting land health standards or ORMP vegetation management objectives and as a result, not consistent with the purpose and need for actions analyzed in detail in this EA.

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.

2.6.8 Idaho Governor's Sage-grouse Management

The following summary of the Governor's Sage-grouse Management Alternative was considered within the Garat EA. Although the BLM eliminated this alternative from detailed study, many concepts and aspects of the alternative are already available to the BLM and have been incorporated into Alternatives 3 through 5 of the EA. These include incorporating habitat characteristics, conducting habitat assessments and priority area assessments, determining methods to achieve habitat objectives, and monitoring to determine effectiveness of planned actions. In addition, the Governor's Alternative was intended for the BLM Idaho RMP amendment process, and BLM understood that this alternative would not be applicable at the project level until the RMP amendment process has been completed. Furthermore, it is appropriate to integrate the entirety of the Governor's Alternative only if it is adopted in the Record of Decision for the ORMP.

The Idaho Governor's Office of Species Conservation, with the unanimous recommendation of the Task Force, adopted a designation of a Sage-Grouse Management Area (SGMA) with three distinct management zones: Core Habitat (CHZ), Important Habitat (IHZ) and General Habitat (GHZ). The BLM recognizes these management areas and have similar habitat zones identified for management of sage-grouse that have been used in the development of the EIS that analyzes alternatives for the land use plan amendments.

Generally, these management zones outline a suite of basic management activities that may, under certain conditions, occur within a given area. In other words, the three management zones within the SGMA represent a management continuum that includes at one end a relatively restrictive approach aimed at providing a high level of protection to the species within the CHZ, and on the other end, a relatively flexible approach for the GHZ allowing for more multiple-use activities. While the IHZ provides greater flexibility than in the CHZ, the overall quality and ecological importance of the habitat within this zone is more closely aligned with the habitat in the CHZ than in the GHZ.

Allocation to a specific management zone does not mandate or direct the relevant Federal agency to propose or implement any action; rather, the three habitat zones provide an array of permitted and prohibited activities. Activities not specifically addressed by the Alternative are still subject to the allowances and restrictions of the applicable resource management plan.

This alternative only provides special management for sage-grouse on lands managed by the BLM and U.S. Forest Service, and while beneficial to other sage-steppe species, agencies will still have the obligation to analyze other values when considering a proposed action.

The relevant Federal agencies considering these measures as part of environmental analyses, planning updates and ESA listing determinations recognize that actions on public lands can have direct and indirect impacts on State endowment trust lands managed by the Idaho Department of Lands. Thus, it is important to evaluate sage-grouse management in a comprehensive and holistic manner.

2.6.9 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

2.7.1 Rangeland Project Maintenance and Construction

Cooperative agreements between the livestock operator and the BLM have assigned responsibility for some rangeland improvement maintenance to the operator. The Petan Co. of Nevada, Inc., (Petan) is required to maintain projects on the Garat allotment. These cooperative agreements will remain in effect regardless of which grazing permit renewal alternative analyzed in this NEPA document is implemented. As a result, maintenance of existing projects is assumed in accordance with existing range improvement permits and cooperative agreements and as a result is outside the scope of this NEPA document.

2.7.2 Suspension AUMs

In accordance with the regulations 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.[52] Suspension AUMs held on permits prior to this planning process would continue to be held on permits as suspension.

2.7.3 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 the Garat allotment. No alternative in this NEPA document will consider authorization to move livestock across public land within the Garat allotment to access grazing authorizations adjacent to or distant from the allotment.

Additionally, the application from the Petan Company of Nevada, Inc., for grazing permit renewal and subsequent meetings with the permittee held identified no need for trailing/crossing authorizations on adjacent public land to access public land within the Garat allotment. No alternative in this NEPA document will consider authorization to trail livestock to or through the Garat allotment in association with the grazing use authorizations.

All alternatives of this NEPA document include authorization to move cattle between pastures within the Garat allotment in order to complete livestock moves as scheduled, including moves through pastures outside the dates of scheduled use for those pastures identified in the grazing schedule. 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 with the majority of the herd are moved through unscheduled pastures in a timely manner.

2.7.4 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 Summary of Analyzed Alternatives

Table ALT-16 and Table ALT-17, which was derived from analysis specific to each resource in Section 3 of this EA, identify the analyzed alternatives' ability to address resource issues related to the Idaho Standards for Rangeland Health and also the ORMP objectives, respectively.

[52] 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 decreased permitted use in suspension was removed from 43 CFR § 4110.3-2. Because such reductions are not a temporary reduction (see, e.g., 43 CFR § 4100.0-5, Definitions), but a reduction under 43 CFR § 4110.3-2 (b), a reduction in active use also results in a reduction to permitted use.

Table ALT-16: Summary of the Idaho Standards for Rangeland Health that would be met in the Garat allotment, including progress toward meeting, under the alternatives analyzed in detail

Alternative	Rangeland Health Standards met (Yes), not met (No), or progress toward meeting (MP)					
	Standard 1: Watersheds	**Standard 2:** Riparian/ Wetlands	**Standard 4:** Plant Communities	**Standard 7:** Water Quality	**Standard 8:** T&E Plants	**Standard 8:** T&E Wildlife
1	No	No	No	Yes	No	No
2	No	No	No	Yes	No	No
3	MP	MP	MP	Yes	MP	MP
4A	MP	MP	MP	Yes	MP	MP
4B	MP	MP	MP	Yes	MP	MP
4C	MP	MP	MP	Yes	MP	MP
5	MP	MP	MP	Yes	MP	MP

Table ALT-17: Summary of the Owyhee Resource Management Plan objectives that would be met in the Garat allotment under the alternatives analyzed in detail

Alternative	RMP Objectives	Summary
1	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would not be met under the current situation.
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would not be met under the current situation.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would not be met under the current situation. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met under the current situation.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would not be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would not be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would not be met under the current situation.
2	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would not be met with frequent grazing use during the active growing season and increased livestock numbers.
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would not be met with frequent grazing use during the spring and active growing season and increased livestock numbers.

Alternative	RMP Objectives	Summary
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would not be met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would not be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would not be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would not be met under the current situation.
3	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would be met with frequent grazing use during the active growing season, livestock numbers unchanged from the existing permit, but with limitations to the intensity of use during the active growing season.
	Soils	The objective to improve unsatisfactory Watershed health/condition on all areas would be met with frequent grazing use during the active growing season, livestock numbers unchanged from the existing permit, but with limitations to the intensity of use during the active growing season.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would make progress towards being met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
4A	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers. Pastures 3 and 4 would also improve at a more rapid rate with year-long rest scheduled in 1 year of each 3 year cycle of the grazing schedule.

Alternative	RMP Objectives	Summary
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers. Pastures 3 and 4 would also improve at a more rapid rate with year-long rest scheduled in 1 year of each 3 year cycle of the grazing schedule.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would make progress towards being met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
4B	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers.
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would make progress towards being met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.

Alternative	RMP Objectives	Summary
4C	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers. Pasture 3 would also improve at a more rapid rate with year-long rest scheduled in 1 year of each 3 year cycle of the grazing schedule.
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would be met with grazing use during the active growing season limited to no more than 1 year of each 3 year cycle of the grazing schedule and reduced livestock numbers. Pasture 3 would improve at a more rapid rate with year-long rest scheduled in 1 year of each 3 year cycle of the grazing schedule.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would make progress towards being met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.
5	Vegetation	The objective to improve unsatisfactory vegetation health/condition on all areas would be met with no grazing use authorized for a term of ten years.
	Soils	The objective to improve unsatisfactory watershed health/condition on all areas would be met with no grazing use authorized for a term of ten years.
	Water Resources/ Riparian	The objective (RIPN 1) to maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions would make progress towards being met. The objective (WATR 1) to meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Resource Area would be met.
	Wildlife	The objective to maintain habitat conditions required to support a high diversity and desired populations of wildlife would be met. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.

Alternative	RMP Objectives	Summary
	Special Status Plants	It is the objective to improve landscape habitat conditions required to support diversity and desired populations of vegetation that would support SSP health and condition, all areas would be met with no grazing use authorized for a term of ten years. The objective to manage special status species and their habitats to increase or maintain at levels where there is no need to listing under ESA would be met.

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, and Analyzed
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
Wildlife Resources			X
Threatened, Endangered, and Sensitive Animals			X
Migratory Birds			X
Range Resources			X
Economic and Social Values			X
Existing and Potential Land Uses		X	
Access	X		
Prime and Unique Farmlands	X		
Wastes, Hazardous and Solid	X		
Environmental Justice	X		
Cultural Resources		X	
Tribal Treaty Rights and Interests		X	

Resource	Not Present	Present, Not Impacted	Present, Impacted, and Analyzed
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

Resources identified as not present within the Garat allotment in the table of resources in Section 3.1 above will not be addressed in this EA.

3.3 Rangeland Vegetation, Including Noxious Weeds and Invasive Plants

3.3.1 Affected Environment

The Rangeland Health Assessment (USDI BLM, 2014b) and Determination (Appendix F) were completed for the Garat allotment in 2014. The Assessment and Evaluation Report identified that the Idaho Standards for Rangeland Health Standard 4 – Native Plant Communities was not 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 (inadequate frequency of rest and/or deferment from livestock grazing until after the active growing season) 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 management. 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.[53]

As noted in the 2014 evaluation report, vegetation communities with a full complement of dominant grasses and shrubs consistent with the natural variability of the reference site are rare within the allotment, and a minor component of invasive species has been recorded. As a whole, sagebrush steppe

[53] The Ecological Status and Production Analysis Report for the August 3-7, 2009 Studies in the Garat Allotment submitted to BLM by Western Range Services in 2011 concluded that the Owyhee RMP ecological status objective has been achieved at the vast majority of sites sampled in the Garat Allotment (11 of 12). The 2014 Garat Allotment Rangeland Health Assessment/Evaluation Report concluded that monitoring data show no apparent trend over the majority of the allotment. BLM nested frequency trend data, consistent with WRS ESI data, identify static or mixed trend within most pastures, while data at the two monitoring sites in pasture 4 recorded downward trend between 2003 and 2009. When these trend data are considered in light of the ecological condition summary presented in Table VEGE-2, the ORMP vegetation management objective to improve unsatisfactory vegetation health/condition is applicable and the conclusion is supported that the vegetation management objective has not been met.

vegetation communities within the allotment exhibit vegetation functional-structural groups that vary from site potential, with an under-representation of dominant deep-rooted bunchgrass species for the sites, primarily bluebunch wheatgrass, Thurber's needlegrass, and Idaho fescue. Representation of Sandberg bluegrass, a shallow-rooted native bunchgrass, is greater than the minor component described in ecological site descriptions for the reference site conditions. The following areas 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: native perennial vegetation communities within sites other than pastures 3, 5, and 6; cheatgrass-dominated potions of pastures 5 and 6; and pasture 4 identified above that did not meet Standard 4. The current vegetation communities within these 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.

However, as also stated in the 2014 evaluation report, recorded upland trend that is static or, at best, only slightly upward, indicates that livestock management practices do not provide adequate rest or deferment from livestock grazing use during the active growing season, especially within pasture 4, where a 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 implementation of less-frequent rest does not provide adequate opportunity for recovery of plant health and vigor following repeated years of active-growing-season use. Sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season and some authors conclude that at least 2 years of deferment for every year of active growing season use should be provided (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Anderson L. D., Bluebunch wheatgrass defoliation: Effects & recovery, 1991) (Miller, Seufert, & Haferkamp, 1994) (USDA NRCS, 2012). Ganskopp (1988) found that Thurber's needlegrass is also impacted from defoliation during the active growing season with that impact greatest during the boot-stage of growth, similar to bluebunch wheatgrass.

Ecological sites and vegetation condition

The ecological site inventory has been the Bureau of Land Management's standard vegetation inventory since 1982. An ecological site is a land structure type with physical characteristics that set 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 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). Vegetation inventories for public lands in Owyhee County were correlated to soil surveys and reported in the Soil Survey of Owyhee County, Idaho[54] (USDA NRCS, 2003b). 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 H.

The potential natural vegetation communities for ecological sites represented in the Garat allotment 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

[54] 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.

inches for some sites to more than 16 inches for one site (USDA NRCS, 2010). Although ecological site descriptions for the Garat allotment 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 limited acreage of other ecological sites, riparian areas, and areas with the surface features naturally devoid of vegetation. Table VEG-1 provides a listing of ecological sites described, a summary of dominant potential vegetation, and acreage for the Garat allotment (see Map ECOL-1).

Table VEG-1: 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 VEG-1 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 in the southern portion of Owyhee County, including the Garat allotment, in the Bruneau-Kuna Grazing Environmental Impact Statement Draft (USDI BLM, 1982).[55] These data were

[55] The 1982 Bruneau-Kuna Grazing Environmental Impact Statement Draft summarized range condition class within the Garat allotment as 56 percent Poor; 28 percent Fair; 15 percent Good; 0 percent Excellent; and 1percent Treated. Range condition class is a rating system related to forage productivity.

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 potential natural community for that ecological site. The similarity index to the potential natural community is the percentage by weight of annual production of plant species present at the inventoried site. Table VEG-2 is a summary of ecological condition within the Garat allotment from the vegetation inventory completed in the late 1970s and updated during development of the ORMP (USDI BLM, 1999a). These data focus the ORMP management objective for vegetation within the Garat allotment to improve unsatisfactory vegetation health/condition on all areas.[56] The static to slightly upward trend identified above does not meet this objective.

Table VEG-2: 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 (PNC).
[2] Treated lands include those where brush control treatments or seedings preclude classification within one of the ecological status condition-classes.

Production data from the 1970s inventories indicate that many species present at potential in the sagebrush/bunchgrass communities within the Garat allotment were less productive than the reference site conditions 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[57]. 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. Ecological site descriptions identify this transition as a result of historic improper livestock grazing and/or altered fire return intervals.[58] 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 (a consultant hired by the Petan Co. of Nevada) 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).[59] Western Range Services, in coordination with BLM, re-inventoried vegetation

[56] Table VEGE-2 in the Proposed Owyhee Resource Management Plan and Final Environmental Impact Statement identifies those allotments, including the Garat allotment, where more than 10 percent of the allotment is in early condition and less than 40 percent is in late condition (also includes Proper Natural Condition).
[57] Analysis of production data is on file in the project record and is available to the public upon request.
[58] See the state and transition models within the USDA-NRCS ecological site descriptions for sites listed in Table VEGE-1
[59] The 1999 Owyhee Resource Management Plan EIS summarized the ecological condition of rangelands in the Garat allotment as 0% PNC, 25% Late, 45% Mid, and 24% Early. Of the 11 vegetation sites sampled in 1979 by BLM that were selected by WRS to re-inventory, 4 (36%) were Late and 7 (64%) were Mid condition in 1979. Sample sites selected by WRS may not be representative of the approximately 58 sample

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 co-dominant with sagebrush in the reference condition vegetation communities described in applicable ecological site descriptions (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 VEG-3.

Table VEG-3: Current Vegetation in the Garat allotment (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 VEG-1 and VEG-3. 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

sites recorded in the 1979 inventory or true rangeland condition within the Garat allotment. Similarly, the ecological status of BLM Vegetation Study Sites used by WRS to monitor ecological status since 1997 may not be representative of ecological status within the allotment with 17% of these sites in PNC, 50% in Late, 17 % in Mid, and 17% in Early seral condition when sampled in 1997, as compared to the ecological status for the allotment reported in the 1999 ORMP EIS.

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 VEG-1 (ecological site potential) and Table VEG-3 (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 2014 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2014b) 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 VEG-1). 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 active restorative management.

Potential forage production

The potential production of forage species in the Garat allotment, based on ecological site descriptions (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 (more recent ecological site descriptions use the term "Representative Value"). The amount of forage necessary to support one AUM is 1,000 pounds[60] and the maximum allowable utilization limit of 50 percent[61], 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 approximately 30 to 40 percent use of forage (Appendix H). With a maximum allowable utilization set 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, 2014b). 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.

[60] 1,000 pounds per AUM includes both that portion of total production consumed and that portion lost through forage efficiency.
[61] 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 healthy rangelands.

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 at site-potential would 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 within sites other than pastures 3, 5, and 6; cheatgrass-dominated potions of pasture 5 and 6; and pasture 4 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, with 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 conditions 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. The ORMP management objective to improve unsatisfactory vegetation health/condition on all areas has not been met. Planned implementation of a rest-rotation grazing schedule for four of the six pastures in the allotment identified within the 1989 agreement, and recent implementation of rest in less than the planned 1-of-3-years cycle, do 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 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 the following 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.

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 2014 evaluation report (USDI BLM, 2014b). Areas where these species dominate were identified in portions of pastures 5 and 6.

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 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.

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 remain the primary adaptation against changing precipitation and temperature regimes. (See also the discussion regarding climate change and its relationship to soils and vegetation in the affected environment section for upland watersheds and soils, Section 3.4.1)

3.3.2 Direct and Indirect Effects

Analyses of Alternative 1 (Current Situation) and the action alternatives 2 through 5 are based on consequences of seasons and intensities of livestock grazing use identified in the Affected Environment section above and Appendix H. In addition, Appendix H provides ecological concepts for expected vegetation change resulting from livestock management practices.

3.3.2.1 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 2 consecutive years of scheduled growing season use of each 3 years in 4 of the 6 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 in pasture 4 at a minimum and would continue to limit improvement in upland condition and trend, as noted in the 2014 Evaluation Report (USDI BLM, 2014b). 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 and plant parts selected through the grazing period. As identified in Appendix H, 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 has and would result in more palatable bunchgrass species, primarily bluebunch wheatgrass, being frequently defoliated during the active growing season and unable 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. Limited benefit would be provided by the scheduled year of rest that would provide carry-over forage. That carry-over forage would supplement forage production during growing season use the following year.

Alternative 1 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 suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season, with a number of sources recommending that at least 2 years of deferment of grazing use outside the active growing season should be scheduled for every year of active growing season use. 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 pastures 5 and 6 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 of pastures 5 and 6 would be better provided than in pastures 1, 2, 3, or 4 with frequent growing season use scheduled.

Intensity of grazing use

Recorded utilization levels at stocking rates under the current situation 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 allotment-wide, 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 H). 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 localized 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 2014 Rangeland Health Assessment and Evaluation Report for this allotment, with portions of pastures 5 and 6 dominated by cheatgrass (USDI BLM, 2014b), 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 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 in the applicants proposed action, unchanged under the performance-based alternative, and 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 years of each 3 years of the grazing schedule indicate that planned management would be harmful to vegetation resources. 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 additional 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 develop.

3.3.2.2 Alternative 2 Effects

Alternative 2 (Applicants' Proposed Action-Option I)[62] would result in an initial active grazing use (allotment-wide stocking rate) that would be 7 percent greater in years 1 through 3 and 21 percent greater in years 4 through 10, when compared to the current situation (Alternative 1). In addition, Alternative 2 would implement a grazing schedule similar to the schedule under Alternative 1. While Alternative 1 provides periodic year-long rest (one year of each 3-year cycle) for pastures 1, 2, 3, and 4, the basic grazing schedule under Alternative 2 would provide periodic deferment from grazing during the early portion of the active growing season. The basic schedule under Alternative 2 would also increase the frequency of opportunity for growing season use in pasture 5 with deferment until after 6/15 in one year of each 3 years, as compared to deferment until after 6/31 in 2 years of each 3 years under Alternative 1. The basic schedule for use of pasture 6 under Alternative 2 would be unchanged from the schedule for pasture 6 under Alternative 1, with annual deferment until after 6/15. Increased flexibility provided under Alternative 2, as compared to under Alternative 1, would additionally reduce the frequency of deferment from grazing use during the active growing season (See Appendix B for recent actual use data).

The combined consequences of implementing a grazing schedule similar to the schedule in Alternative 1, with more frequent opportunity to allow grazing during a portion of the active growth season for native bunchgrass species, and an increase in the intensity of grazing use under Alternative 2, would not allow the health and vigor of native perennial species to improve. Although under Alternative 2 the grazing schedule includes deferment during a portion of the active growing season in one year of each 3-yearperiod for pastures used during the active growing season, opportunity for perennial species to recover from growing season grazing in the preceding 2 years would not occur with a single year of partial deferment. In addition to the frequent growing-season use, the increased intensity of grazing resulting from the greater number of cattle and resulting higher active use would also limit recovery of the health and vigor of native perennial species. Alternative 2 would not allow improvement in the health and vigor of native perennial vegetation in pasture 4 or progress toward meeting Standard 4. The remaining portions of the allotment would be less likely to continue to meet the Idaho Rangeland Health Standard for native plant communities with implementation of the applicant's proposed action and the condition of vegetation communities would not 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 that allows grazing in successive years during all or a portion of 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

[62] The applicant's proposed action Option II was considered, but not analyzed in detail, as described in Section 2.6.2 of this EA.

would retain flexibility to graze native perennial vegetation communities frequently during all or a portion of the active growing season. Although deferment in one of each three-year period is scheduled for pastures 1, 2, 3, and 5, growing season grazing in the remaining two 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 one year of each 3-year cycle or rest in one year of 5 years, as proposed for pasture 4, does not provide adequate opportunity for recovery of health and vigor for native perennial species. Alternative 2 includes flexibility to graze pasture 4 beginning early and continuing throughout the active growing season and pasture 6 during the later portion of the active growing season in years when water is scarce in other pastures that are scheduled for spring use (start of grazing by March 15 in pasture 4 and start of grazing by June 15 in pasture 6). This would fall short of meeting requirements for periodic rest or deferment, especially in years of limited livestock water. Years of limited livestock water are generally also years of drought and reduced effective soil moisture for plant growth. In addition, years of limited available livestock water in pastures other than pastures 4 and 6 would result in only the more reliable water sources in pastures 4 and 6 remaining, concentrating livestock use adjacent to these more reliable water sources. When the 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. This decline in health and vigor would be increased in the vicinity of reliable water sources in pastures 4 and 6.

The applicant's proposed action also requests additional flexibility outside the parameters identified in the application 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 in a manner that would defer grazing use of spring use pastures until after the active growing season in alternate years or more frequently. Without the use of flexibility in the grazing schedule in a manner that meets the recovery and maintenance needs of desirable perennial plant during the active-growing-season use and throughout the grazing season neither Standard 4 nor the ORMP objective for vegetation would be met under Alternative 2 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 7 percent during years 1 through 3 and 21 percent during years 4 through 10, when compared to the current situation (Alternative 1). The conclusions in the 2014 Evaluation Report (USDI BLM, 2014b) and Determination (USDI BLM, 2014b) do not support an increase in active use, with Standard 4 not being met in pasture 4 due to current livestock management practices and ORMP vegetation management objectives not being met throughout the allotment. The initial increase would result in stocking the allotment at 10.0 acres per AUM in years 1 through 3 and 8.9 acres per AUM in years 4 through 10. These stocking rates are calculated allotment-wide and do not take into consideration portions of the allotment that would be stocked at much greater levels due to limited water availability, topography, and other factors contributing to concentrated livestock use. Utilization levels would be expected to increase,

consistent with the phased increase in active use. As noted above, under ideal conditions, approximately 4.8 acres would be required to support one AUM in the allotment, assuming all ecological sites in the allotment were at site potential, livestock distribution was equal throughout the allotment, and allowable utilization of available forage was 50 percent. The potential to graze the allotment at a stocking rate of 10.0 or 8.9 acres per AUM allotment-wide 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 7 percent initial increase and eventual 21 percent 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[63]. At a minimum, the initial increase in active grazing use authorization and additional increase later during 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 H).

As a result of the phased increases in active grazing use that would exceed 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 be static or trend downward. Ecological condition would not improve to the limited degree identified under Alternative 1, due to the proposed increased stocking rate and resulting heavier utilization levels.

Saddle Horse Use

Recognition of the existing enclosures at Stateline Camp and Four Corners Camp and authorization of saddle horse use of these enclosures up to a maximum of 177 AUMs through the grazing season (3/15 to 10/15), would result in a stocking rate of 7.6 acres per AUM and would include the annual grazing over a long duration of the total season of use, including the active growing season for upland perennial species. As noted in the analysis of grazing use by cattle under Alternatives 1 and 2 above, frequent grazing during the active growing season, especially when that grazing occurs at elevated intensities, would not maintain or improve health and vigor of desirable perennial species. Season-long horse use at proposed levels would not allow ORMP vegetation management objectives or Standard 4 to be met in the long-term. In the absence of recent actual use, utilization, or trend data specific to these enclosures, increasing authorized horse use from that authorized in the existing permit is not supported.

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 7 percent initially and 21 percent within the term of the permit, that risk is increased as compared to Alternative 1. The risk is 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

[63] The permittee's earlier 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.

The 2014 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 of vegetation resources 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 again within the term of the permit. 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. In addition, saddle horse use under Alternative 2 within enclosures at Stateline Camp and Four Corners Camp would result in grazing during seasons and at intensities that would result in failure to meet ORMP objectives to maintain or improve vegetation health and vigor, as well as failure to meet rangeland health standards related to vegetation in those enclosures. The Idaho Rangeland Health Standard for native plant communities would not be met in more locations of the allotment with implementation of the applicant's proposed action than under the current situation, and the condition of vegetation communities allotment-wide would decline. 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 that allows grazing in successive years during the active growing season. Frequent cattle and horse grazing during the active growing season would lead to a portion of the allotment remaining in early to mid-ecological condition. With phased increases of livestock numbers, 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 other stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance from downward trend induced by changing climate and resilience for recovery would not develop.

3.3.2.3 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 for wildlife. These performance-based terms and conditions would provide substantial improvement to native plant communities, 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 equal to stocking rates identified in current permit to graze livestock in the allotment. BLM determined that those stocking rates are not necessarily inconsistent with maintaining or improving desirable perennial plant health and vigor. 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. In addition, 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 beneficial effects to upland vegetation resources from limiting the intensity of grazing use of riparian vegetation and additional indirect beneficial effects to upland vegetation resources from limiting the intensity of grazing use of wildlife habitats, the upland growing season utilization limit (less than or equal to 20 percent), would require more intensive livestock management practices to distribute livestock and associated impacts more evenly throughout each pasture. This more intensive livestock management would result in location-specific and permittee initiated reductions in livestock use to limit the intensity of use of all three resources. Greater distribution

of livestock or permittee-initiated livestock management actions would result in reduced impacts to upland 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 under Alternative 1, although the combined effect of seasons and intensities of grazing use would differ as discussed below and in Appendix H.

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-VEG-4.

TableVEG-4: 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
	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

Alternative 3's increased intensity of livestock management practices to ensure 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 (less than or equal to 20 percent). The reduction in growing-season utilization levels from current levels (Table VEG-4) to less than 20 percent equates to removal of a smaller portion of photosynthetically active leaf surface area and removal of fewer tillers during the active growing season. Limits on the utilization level during the active growing season 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 under 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 under the Current Situation alternative (Alternative 1).

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

Performance-based terms and conditions for riparian resources and special status species habitat would also result in lower intensities of use of upland 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 or result in livestock management practices that distribute livestock use more evenly.

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 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 under 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, progress toward meeting the Idaho Rangeland Health Standards for native plant communities would be attained 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 conditions 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 2014 Rangeland Health Assessment and Evaluation Report

(USDI BLM, 2014b) 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. At the same time, the scheduled duration of use provides opportunity for frequent re-grazing by livestock during the growing season (more than three times) and limited chance for regrowth following scheduled grazing use in 2 of 3 years of the grazing schedule. In combination, the intensity constraints during the active growing season would offset the other factors and result in less-harmful impacts to plant health than would occur 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 develop.

3.3.2.4 Alternative 4 Effects

Under all three sub-alternatives, the same grazing schedule for pastures would be implemented, differing between sub-alternatives only in the availability for use of some pastures after June 30 and required livestock management practices. This season-based alternative would implement a pasture rotation schedule that includes less-frequent use during the critical growth period of upland perennial species for pastures 1, 2, 3, and 4, when compared to alternatives 1, 2, or 3. 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 alternatives that would authorize grazing use (Alternatives 1-3). 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 (AUMs) 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 resulted in the allotment's failing to meet both the Rangeland Health Standard 4 in pasture 4 and the ORMP management objective for vegetation, the combined grazing schedule and reduced level of livestock use proposed under Alternative 4A, 4B, or 4C would allow progress toward meeting Standard 4 in pasture 4 and 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 that would authorize grazing over the next 10 years. The grazing schedule would implement a rotation through pastures 3, 4, 5, and 6 that would limit grazing use to 1 year in 3 years during the active growing season (May 1 to July 1). The 3-year deferred-rotation grazing schedule 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).

As identified in Appendix H, 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 dedication of photosynthate to replace grazed leaf material or to replace grazed tillers midway through the growing season. The ability of more palatable deep-rooted perennial species (bluebunch wheatgrass, Idaho fescue and Thurber's needlegrass) to compete with other less-palatable native species (Sandberg bluegrass and squirreltail) and introduced annual and invasive species (primarily cheatgrass) would be improved. Similarly, the ability of deep-rooted native and introduced 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 in 2 years of each 3-year cycle, would allow perennial species to regrow following grazing and complete their annual growth cycle, utilizing soil moisture that remains after grazing use. Although grazing use would be authorized to extend through June 30 in 1 year of 3 years within pastures 1 and 2, opportunity for regrowth in the remaining 2 years of each 3-year cycle after April 15 in the absence of livestock grazing would allow perennial species to regain health and vigor.

Flexibility to use pasture 5 concurrent with pasture 6 or other pastures used in the 3-year deferred rotation schedule would continue to provide appropriate deferment of use in pasture 5 and opportunity for recovery following any growing season use. Scheduled concurrent use of pasture 5 with either pasture 6 or another pasture would not confine grazing use to the poorly watered pasture 5 during any portion of the grazing season during the 3-year grazing cycle.

Exclusion of livestock use from Piute Camp Enclosure and Piute Creek Enclosure (pastures 7 and 8) would remove livestock impacts of grazing use (all seasons and all intensities associated with livestock grazing) from the limited acreage within the enclosures adjacent to a portion of Piute Creek. Opportunities for recovery of health and vigor of upland perennial species adjacent to an area of past livestock concentration would be provided.

Implementation of riparian constraints under Alternative 4A would provide additional opportunity for recovery of native and introduced bunchgrass health and vigor following growing-season use. Alternative 4A includes one full year of rest in the 3-year grazing cycle for pastures 3 and 4 in place of a deferment year. Rest in this 1 year of the 3-year cycle under Alternative 4A would allow full growth to occur and retention of vegetation to contribute toward standing and down litter for soil protection. Additionally under Alternative 4A, grazing use in pastures 3 and 4 would end on June 30 in the 1 of 3 years of scheduled growing season grazing, resulting in a lower intensity of grazing use in that year than would occur under Alternative 4B. Riparian constraints under Alternative 4B would not preclude grazing use in portions of these pastures more distant from riparian resources associated with Piute Creek, but the upland constraints would continue to defer grazing use until after the active growing season in 2 of 3 years. Alternative 4C would provide for 1 of 3 years of rest for pasture 3 similar to Alternative 4A, with benefits for maintaining and improving native perennial species health and vigor. With the reach of Piute Creek in pasture 4 managed as a water-gap under Alternative 4C and the available seasons and frequency for grazing use of pasture 4 not limited by riparian constraints, benefits to perennial bunchgrass species resulting from seasons of scheduled use would be similar to those benefits identified under Alternative 4B. Benefits to native perennial bunchgrasses in close proximity to Piute Creek under Alternative 4B would be greater than under 4C. Livestock management under 4B would remove livestock impacts on uplands adjacent to riparian communities.

Intensity of grazing use

By 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. The reduction in authorized grazing levels is largely the product of the seasons of use appropriate for meeting upland vegetation and special status species habitat objectives. However, mid-summer constraints to meet riparian resource objectives would contribute toward reductions in the intensity of grazing use following the active growing season when pastures are scheduled for rest. The combined constraints would limit the intensity of grazing use during the active growing and also throughout the grazing season.

Alternative 4 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. This pasture-specific stocking rate can 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. Flexibility provided in the grazing schedule annually after June 30 would provide opportunity to adjust scheduled pasture use to climatic conditions and other factors, while retaining 10 acres or more per AUM. While flexibility to use multiple pastures after June 30 would be available under all sub-alternatives of Alternative 4, the number of pastures available for mid- to late-season grazing in any year of the 3-year schedule would be fewer under Alternative 4A than under Alternative 4C. Similarly, fewer pastures would be available for grazing after June 30 under Alternative 4C than under Alternative 4B. The result of fewer pastures available after June 30 under a sub-alternative would be a higher intensity of grazing use in available pastures. At the same time, the schedules for all sub-alternatives retain 10 acres or more per AUM of planned grazing use in each pasture through the 3-year cycle. In summary, 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 under all sub-alternatives of Alternative 4, as compared to Alternative 1, 2, or 3.

Reduced utilization within most pastures of the allotment, as would occur with stocking rates 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 or Alternative 2. The opportunity to maintain or improve health and vigor of native perennial species would be similar to Alternative 3, although with reduced risk that are associated with any failure to ensure compliance with limitations to intensity of use under Alternative 3.

The ability of desirable deep-rooted 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 improve. 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.

Saddle Horse Use

Recognition of the existing enclosures at Stateline Camp and Four Corners Camp and authorization of saddle horse use of these enclosures, up to a maximum of 106 AUMs through the grazing season, would result in a stocking rate of 12.8 acres per AUM and would include the annual grazing over a long duration, including the active growing season for upland perennial species. As noted in the analysis of grazing use by cattle under Alternatives 1 and 2 above, frequent grazing during the active growing season, especially when that grazing occurs at elevated intensities, would not maintain or improve health and

vigor of desirable perennial species. Light use and limited re-grazing of most plants during the active growing season for perennial vegetation, resulting from use by an average of 10 head of horses, would allow maintenance and recovery of health and vigor of desirable plants. Horse use at proposed levels, although season-long, would not preclude meeting the ORMP vegetation management objectives and Standard 4. Although an absence of recent actual use, utilization, or trend data specific to these enclosures exists, increasing authorized horse use slightly as a result of extending authorized use through 10/15 from that authorized in the existing permit is supported by consideration of the low intensity of growing-season use and overall stocking rate for the enclosures.

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 under 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 year in 3 years. However, 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 analyzed. Progress toward a full complement of native perennial species consistent with the reference site conditions 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 mitigate the additive stressors induced by climate change, primarily altered precipitation and temperature regimes. Vegetation communities that retain resistance and resilience from adverse impacts induced by changing climate would develop.

While the combined grazing schedule and reduced level of livestock use proposed in all sub-alternatives of Alternative 4 would allow progress toward meeting Standard 4 in pasture 4 and improve rangeland health to better ensure meeting Standard 4 and the ORMP management objective for vegetation over the long term, Alternative 4A would provide for the greater resilience toward meeting objectives and standards than would Alternative 4C. Alternative 4C would provide for the greater resilience toward meeting objectives and standards than would Alternative 4B. This greater resilience under the sub-alternatives is due to the more frequent year-long rest provided for pastures 3 and 4 under Alternatives 4A and 4C as compared to 4B.

3.3.2.5 Alternative 5 Effects

Implementation of the no-grazing alternative would provide a rate of recovery toward ecological site potential more rapid than other alternatives analyzed. 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 conditions 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 associated with the existing permit 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 progress toward meeting the standard 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, natural disturbance regimes, and other ongoing activities. Vegetation communities that retain resistance and resilience from downward trend induced by changing climate would develop.

3.3.3 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 and water to distribute seeds and other genetic material.

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-5. The data used represent the best available information. The calculations based on these data are approximate.

Table VEG-5: 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 the 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 heavy livestock use of less than 1/8-mile of impact to vegetation resources around each water development, the 78 water developments identified in Table VEG-5 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 through time 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 1960, totaling 54,082 acres (some areas have burned more than once during this period) (Map FIRE-1), exhibits the natural variability consistent with multiple reference site conditions. 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 is both beneficial, leading toward conditions within the natural variability of the reference site conditions, and indirectly adverse, leading toward residual impacts that often have resulted in vegetation composition that varies in one or more aspect from reference conditions and 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 3.3.1). 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 in poor condition.

In combination, past, present and reasonably foreseeable future actions that have led to 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 to 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 VEG-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 a threshold of acceptable cumulative effects to limit downward trend and conditions that lead away from the native perennial vegetation composition defined in the reference site conditions for ecological site descriptions. A second cumulative effects threshold for vegetation resources in the Garat allotment is to meet Standard 4 of the Idaho Standards for Rangeland Health.

3.3.3.1 Alternative 1 Cumulative Effects

Under Alternative 1, Standard 4 would not be met due to current livestock management practices that do not provide adequate opportunity for recovery of perennial herbaceous species following repeated grazing use during the active growing season. Additionally, 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, the anticipated static to downward trend in the vegetation condition within the Garat allotment would not meet ORMP vegetation management objectives. The threshold would be exceeded as a result of unacceptable change in vegetation condition with greater departure from reference site conditions. In addition, impacts from actions proposed under Alternative 1, when combined with past, present, and reasonably foreseeable actions, would not lead to meeting Standard 4 in pasture 4.

3.3.3.2 Alternative 2 Cumulative Effects

Alternative 2 would not allow improvement of vegetation resources in pasture 4 or progress toward meeting Standard 4. 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 thresholds for unacceptable change in vegetation condition would be exceeded.

3.3.3.3 Alternative 3 Cumulative Effects

Under Alternative 3, progress would be made toward meeting the Idaho Rangeland Health Standards for native plant communities 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. Limitations to utilization during the active growing season would lead to improving ecological status and rangeland health on pastures 1, 2, 3, and 4. Progress toward a full complement of native perennial species consistent with the reference site conditions 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 Standard 4 for rangeland health. Progress would be made toward improving vegetation condition and the thresholds of unacceptable change would not be exceeded.

3.3.3.4 Alternative 4 Cumulative Effects

The season-based alternative, including all sub-alternatives, with the implementation of seasonal constraints on periods of grazing use to meet resource objectives and with the 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 occur over the 10-year term of the permit in all pastures of the Garat allotment and progress toward meeting Standard 4 would occur in pasture 4. Improving vegetation conditions would be greatest under sub-alternative 4A, followed by sub-alternative 4B; conditions would improve the least under sub-alternative 4C, although progress would be made. 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 made toward improving vegetation condition and the thresholds of unacceptable change would not be exceeded.

3.3.3.5 Alternative 5 Cumulative Effects

Under the no-grazing alternative, the Idaho Rangeland Health Standard for native plant communities would be met, including progress toward meeting the standard 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 made toward improving vegetation condition and the thresholds of unacceptable change would not be exceeded.

3.4 Upland Watersheds & Soils

3.4.1 Affected Environment

Introduction

A compilation of quantitative and qualitative data, along with aerial photography, GIS data, soil survey information, and a site visit contributed to the evaluation of conditions for the upland soil and watershed resources. Findings were gathered and evaluated in the Rangeland Health Assessment (USDI BLM, 2014b) and Garat Determination (Appendix F) (RHA) and serve as integral supplemental documents that are hereby included by reference to provide the basis on which upland soil watershed conditions are based. These documents disclose whether the Idaho Standards for Rangeland Health are met, provide rationales and causes for the pastures to be meeting or not meeting Standards, and supply the background for alternative development.

Due to the variable nature of soil impacts associated with grazing management, it is difficult to allocate concrete disturbance acres with each alternative. The following soils analysis therefore focuses on a qualitative, rather than quantitative, approach of analyzing the environmental effects of proposed grazing activities on the existing conditions of soil and upland resources for the Garat allotment (Map GEN-1).

Geology, Parent Material, and Soils[64]

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 classified 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-1), which are developed based on environmental factors such as vegetation, soils, and hydrology.

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

[64] All relevant data and reports are saved in the project file and are available from the Owyhee Field Office upon request

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-1). 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

BLM reviewed the available data (see 2014 RHA (USDI BLM, 2014b) and Determination (Appendix F)), which show that 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. Departures from expected conditions rated as moderate (Table SOIL-1) 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. As a whole, the allotment currently fails to meet Standard 1 – Watersheds because historic livestock grazing and artificial fire regimes have negatively affected native vegetation and, as such, adversely impact soil/site stability and hydrologic function.

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

Allotment & Pasture #		Meeting Standard 1 - Watershed		ORMP Soil Objectives not met
	Departure Rating	Yes	No	
Dry Lake – Pasture 1	moderate		x	x
Piute Creek – Pasture 2	slight-to-moderate	x		
45 Field – Pasture 3	moderate		x	x
Kimball – Pasture 4	slight-to-moderate	x		x
Big Horse Basin – Pasture 5	slight-to-moderate	x		
Juniper Basin – Pasture 6	moderate		x	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-2) 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 rangeland health field assessment sites.

Table SOIL-2: 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-1). 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 assessed in that pasture occur within the old fire perimeters and show that plant communities are dominated by annual species. 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 ORMP Objectives and Standard 1 – Upland Watershed & Soils

The allotment currently fails to meet ORMP objectives and Standard 1 for upland watershed and soils 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 herbaceous 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. A consistent downward trend in the frequency of deep-rooted native perennial bunchgrasses in pasture 4 adds to a reduction in hydrologic and biotic function.

In pastures 1 and 3, the presence and/or the lack of fire, along with historic grazing, has reduced desirable deep-rooted bunchgrasses needed to 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 revealed in water flow patterns, pedestals, and bare ground that show departures from reference conditions, particularly in 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. Current heavy livestock use surrounding Juniper Reservoir and Piute Reservoir, water developments, trailing 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 2014 Garat RHA and Evaluation Report (USDI BLM, 2014b) and Determination (Appendix F) 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.

3.4.1.1 Environmental Consequences Common to All Alternatives

Analyses of the alternatives are based on consequences of seasons and intensities of livestock grazing use (Appendix B) that have led to the current conditions for soil as displayed above. Consequently, Alternatives 2 through 5 are compared with Alternative 1 (current condition) to assess the different levels of effects on soil and upland watershed conditions. A brief comparison with the remaining alternatives is also discussed. The following section provides ecological, physical, and biological concepts for expected soil impacts resulting from livestock management practices and is common to all grazing alternatives.

Common environmental consequences from direct and indirect effects of the individual alternatives follow.

A detailed discussion of rangeland vegetation inventory and ecology and the concepts of the state-and-transition model can also be found in Appendix H. More site-specific information on plant communities for the allotment is available in the Upland Vegetation Section 3.3. For processes involving upland soils and sediments and their effects on water resources, riparian areas, and wetlands, please refer to Water Resources Sections 3.6.

Introduction

The effects and consequences of grazing on soil resources are related to the intensity, season, frequency, and duration of use by livestock. Livestock primarily affect soils via two methods. First, the consumption of vegetation can indirectly alter plant composition, ecological function, and community structure, health, and diversity. Second, impacts from hoof action physically affect soils directly through trampling and compaction. All impacts can lead to changes in soil physical, chemical, and/or biological properties.

Soil physical properties include soil bulk density, erosion, surface crusts, and infiltration. Soil chemical properties consist of minerals, organics, soil nutrients, and pH. Soil biological properties include micro- and macroorganisms that can have considerable influence on soil structure and nutrient availability. Alterations to any of these properties from inappropriate grazing management practices can affect the fertility, productivity, and sustainability of soils and associated native plant communities and managed rangelands.

Activities that have caused soil disturbance in the analysis area include livestock grazing and recreation, with the latter generally limited to vehicular use and restricted to existing roads and trails. Early grazing and modern land use practices have contributed to wide-ranging landscape changes and have altered wildfire occurrence from historic levels (Quinney, 1999). Historic and current grazing management has influenced fire frequency by reducing fine fuels that carry fire; conversely, with the establishment of perennial and annual weeds, the risks of greater soil burn severity, higher-than-normal erosion, and associated sedimentation increase.

Soils and Vegetative Cover

Vegetation controls soil erosion with its canopy, roots, and litter components; erosion influences vegetation through composition and structure of the plant community, as well as growth pattern (Gyssels, Poesen, Bochet, & Li, 2005). Vegetation protects the soil against wind and water erosion through the physical binding of soil particles by stems and living roots, raindrop interception, and the retention of runoff. Consequently, soil surface and ground cover disturbance from grazing reduces the capability of a site to withstand the loss of soil resources by wind and water erosion and essentially leads to higher nutrient loss (Rietkerk & van de Koppel, 1997). With ongoing reduction in plant density, plant growth can be reduced below grazing-induced plant losses, thereby adversely affecting the stability of the grazing system; as part of a downward cycle, the negative plant/soil interaction can lead to further degradation.

Soil loss results from the combined effect of aboveground biomass and roots (Gyssels, Poesen, Bochet, & Li, 2005) due to the reduced protective cover and soil binding capabilities from diminished root depth and strength. A decline in cover increases bare ground that initiates larger and more connected surface water flow patterns. The resulting accelerated erosion and movement of sediments leads to soil loss and degradation, changes in infiltration patterns, and loss of organic matter and persistent litter (Lusby, 1965) (McCalla, II, Blackburn, & Merrill, 1984a) (Meeuwig, 1970) (Meeuwig, 1971). 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, leading to additional decline in rangeland health.

When bunchgrass communities transition from deep-rooted species to shallow-rooted plant communities, or when invasive annuals dominate, soil erosion potential increases. A number of sources suggest limiting the intensity of grazing use of bluebunch wheatgrass during the active growing season and limiting active growing season use with periodic deferment or year-long rest (Stoddart, 1946) (Blaisdell & Pechanec, 1949) (Mueggler, 1972) (Mueggler, 1975) (Miller, Seufert, & Haferkamp, 1994) (USDA NRCS, 2012) (Burkhardt & Sanders, 2010) (Anderson L. D., 1991). Some of these sources suggest this deferment or rest occur as frequently as 2 of every 3 years or more often. Conservation of native bunchgrasses therefore plays a vital role in upholding soil stability through management of rangeland vegetation.

Soil stability is the primary control over the fertility, productivity, and sustainability of managed ecosystems and serves as a major indicator of long-term range productivity and health. Disturbance to surface soils by livestock grazing can adversely influence ecosystems through the alteration of vegetation cover, soil physical properties, microbial communities, carbon cycling, nitrogen fixation, and hydrologic properties (Schlesinger, Raikes, Hartley, & Cross, 1996).

Where livestock utilization levels are increased, the quantity of vegetative material is reduced and canopy cover declines. Additionally, deposition of protective plant litter to the soil surface, incorporation of litter into the soil, and the density and distribution of plant roots in the soil profile are decreased. As a result, a reduction in vegetative material allows for increased runoff due to reduced infiltration capacities and elevated erosion potential (Pluhar, Knight, & Heitschmidt, 1987) (Thurow, Blackburn, & Taylor, Jr., 1986). The effects of changes in the amounts of available soil moisture can, therefore, be expressed by changes in the biomass of grasses and of woody vegetation, and of infiltration rate (Walker, Ludwig, Holling, & Peterman, 1981).

Seasonal Effects on Soils

Physical Impacts

Impacts on soils and upland watershed resources vary during different grazing seasons and from changes in vegetation due to annual use of a pasture (Table SOIL-3). During the winter, frozen soils are more resilient to mechanical hoof damage and compaction. However, when grazing occurs during late winter, spring, and early summer season on wet or saturated soils, the physical impacts of compaction and pugging (plunging hoofs into wet soil, forming a void) create long-lasting consequences (Warren, Thurow, Blackburn, & Garza, 1986) (Eldridge S. , 2004). These impacts not only inhibit water infiltration and increase puddling, surface runoff, and erosion, they also reduce vegetative growth because the modification of soil structure and sealed soil pores restrict the movement of water, air, and roots (Bilotta, Brazier, & Haygarth, 2007).

Table SOIL-3: Summary of seasonal grazing effects on several soil related variables; seasons may overlap based on elevation, aspect, and topographic differences.

Season of Use	Soil Moisture	Grazing Effects					
		Vegetation	Pugging*	Biological Soil Crusts	Compaction Potential*	Erosion Potential	General Effects
Early Spring Grazing (Feb. – Mar.)	available for veg growth; some frozen soils	low - annuals available; most others dormant	low to high depending on freeze/melt conditions	low/mod*	high – increased during thaw	low/high*	**low/high**
Upland	reduced to no availability as	high - critical growth	high at first, reduced in	mod/high	high – increased	low/mod*	**high**

Season of Use	Soil Moisture	Grazing Effects					
		Vegetation	Pugging*	Biological Soil Crusts	Compaction Potential*	Erosion Potential	General Effects
Growing Season Grazing (Mar. - July)	season progresses; increasingly less regrowth potential	and seed production; reduced ground cover w. grazing	early summer		during wetter months		
Summer Grazing (July – Oct.)	limited to no availability for regrowth	low/mod – minimal growth; reduced ground cover w. grazing	low	high	low/mod – increased congregation near water sources	low	**low/mod**
Fall Grazing (Oct. – Nov.)	available	low/mod - emerging annuals	low/mod	mod/low	low/mod	low/mod	**low/mod**
Winter Grazing (Dec. – Feb.)	available; frozen soils	low – emerging annuals; most others dormant	low/mod	low*	moderate/high – increased with freeze thaw	low/mod	**low/high**

*can be excessive with high or prolonged precipitation event

Medium- to heavy-textured soils, typically clay, are especially prone to damage during the early seasons 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 (Warren, Thurow, Blackburn, & Garza, 1986). Severe weather conditions, such as snow storms, may also limit animal distribution and can result in heavy localized congregation that leads to utilization or elimination of the remaining plant cover, thus increasing the susceptibility to localized compaction, pugging, and pedestaling.

Physical impacts are always more damaging where the soil is bare, so maintenance of good vegetative cover is essential to lessen the effect of cattle hooves on soil. In areas of water, shade, salt, or mineral locations, compaction from livestock congregation and trail networks can initiate runoff and result in accelerated short- or long-distance movement of sediments.

Where flexibility in the grazing schedule is given, the number of livestock could vary and be increased. Thus, while AUMs may stay the same, grazing intensity could increase with elevated livestock numbers over a shorter amount of time and could negatively affect upland soil and watershed health, depending on the season of use. Where livestock numbers are more clearly defined to identify the maximum numbers of cattle on all landownership within the allotment, the opportunity to add an unidentified number of livestock over a shorter amount of time would be removed. This would reduce physical impacts of trampling, compaction, and pugging to soils that can increase with elevated livestock numbers and season of use.

Biological Soil Crusts

Mechanical impacts from livestock not only disturb soil structure, they negatively affect biological soil crusts that function as living mulch, retain soil moisture, provide stability, influence nutrient cycling, and discourage annual weed growth. Biological soil crust condition and spatial extent are indicators of the ecological health of the plant community; thus, disturbance that results in even small losses of biological crusts can dramatically reduce site fertility and soil productivity and soil moisture retention, and further reduces soil surface stability and soil organic matter (Eldridge & Greene, 1994) (Belnap & Gillette, 1998).

Season of use by livestock has a significant effect on biological soil crust cover values and species richness (Marble & Harper, 1989). As crustal species are only metabolically active when wet and are brittle when dry, physical disturbance during the summer season is generally more destructive, and organisms do not recover as easily as when disturbed in wet seasons. Although biological soil crusts are not as fragile during moist periods and may continue to grow from late winter through early spring with favorable soil water conditions, growth can be disrupted if heavy livestock surface disturbance persists during that time.

Recovery depends on the composition of the soil crust, severity and timing of the disturbance, climatic events during and following disruption, and proximity of surrounding inoculant sources (Anderson, Harper, & Holmgren, 1982) (Johansen & St. Clair, 1986) (Marble & Harper, 1989) (Belnap & Gardner, 1993). Although partial recovery from trampling by livestock can occur in less than 20 years, estimated time for full recovery may range from 30 to 40 years for cyanobacteria, 40+ years for mosses, and 50 to 100+ years for lichen where the crust is entirely removed (Belnap, et al., 2001).

Utilization & Stocking Rate

Impacts on soils from changes in vegetation due to utilization of a pasture vary depending on the season. Heavy continuous grazing is generally most impactful to soil hydrologic function, while the effects of moderate to light continuous grazing are significantly less deleterious and frequently are not significantly different from each other (McCalla, II, Blackburn, & Merrill, 1984a). Heavy to severe defoliation exposes the soil surface to erosive forces of wind and water and affects the soil moisture regime. Moderate utilization, in years with minimal soil moisture availability for regrowth after use, can deplete plant vigor and health, especially during periods of critical growth. Light to moderate utilization (see Section 3.3.1 and Appendix B – Table B-2) of early vegetative growth has minimal impacts on regrowth when adequate soil moisture is available for completion of the annual growth cycle.

Invariably, the most productive and palatable forage species decline in cover under heavy stocking, but they tend to increase under light rates, though more impacts can be observed on forage production than plant composition (Holechek, Gomez, Molinar, & Galt, 1999). Because stocking rates and ecological condition appear to have a close relationship, differences in AUMs per acre can provide a measure that allows for comparison of potential soil impacts caused by variable stocking rates in a given pasture or allotment. For details on stocking rates, refer to Rangeland Vegetation Section 3.3 and Appendix D.

Livestock Congregation

Although native upland communities are less susceptible to negative impacts from defoliation during the summer, livestock often congregate near water developments or riparian sources during the hot season and can intensify localized impacts on upland and riparian soils within areas of concentrated activity (Clary & Webster, 1989). While riparian zones within managed rangelands generally only account for a minor proportion of the overall area, they are a critical source of diversity and productivity. During heavy winter storms, similar patterns can be expected. Disproportional congregation of livestock during any season therefore increases the likelihood of impacts to protective ground cover, resulting in compromised soil stability and hydrologic function in localized areas compared to remaining portions of the pastures.

Soils and Invasive Plants

The dominance or spread of cheatgrass and other invasive annual plants in several portions of the pastures is reflected in the monitoring data and was evident during the field visit[65]. Invasive annual plants modify

[S] See Soil Field Report (in the project record)

the ecosystem attributes of soil temperature and soil water distribution, provide less root mass and soil stability than perennial bunchgrasses, reduce the diversity and cover of microbiotic crusts, out-compete native plants, and adversely alter fertility and organic matter from shortened fire intervals and their associated impacts (Pellant, 1996). Also, deep percolation is limited when shrubs and deep-rooted bunchgrasses are reduced or absent. As a whole, invasive annuals alter environmental conditions or resource availability, thereby causing functional as well as compositional change (D'Antonio & Vitousek, 1992).

Intense (high stocking rate), severe (high utilization levels), and repeated (multiple defoliation events in the same season) grazing can suppress competition from native plants and cause soil disturbance that can favor annual invasive grasses (Strand, Launchbaugh, Limb, & Torell, 2014). The resulting increased bare ground and gaps in perennial vegetation may serve as an early warning indicator of when cattle grazing or other stressors are compromising resistance of a sagebrush ecosystem to annual invasive plants; maintaining and conserving bunchgrass cover and community structure therefore continues to be of highest priority (Reisner, Grace, Pyke, & Doescher, 2013) (Strand, Launchbaugh, Limb, & Torell, 2014).

Using cattle to reduce herbaceous biomass to levels that would strongly influence fire behavior under extreme fire conditions would require reductions and utilization levels that would potentially degrade shrub and grassland communities and compromise sustained livestock production (Launchbaugh, et al., 2008). This is especially critical for soils, as targeted grazing generally occurs during the late winter and spring season when wet soils are especially susceptible to impacts. On the other hand, the highly flammable conditions associated with standing dead cheatgrass and other non-native annuals increase the risk of wildfire and post-fire erosion hazard. The resulting combination of water erosion on unprotected steep slopes and wind erosion promotes soil surface loss and degradation, reduces soil productivity, and adds to deteriorating conditions.

Individual plant species can affect rates of litter accumulation and availability, with the litter of a variety of grass species differing in rates of decomposition and nutrient immobilization or release (Facelli & Pickett, 1991). These differences can establish feedbacks that affect both litter quality and the rates at which soil nutrients are released from organic to inorganic forms. Monocultures, such as cool-season invasive annuals that produce nutrient-poor litter, can reduce soil nutrient storage and affect long-term range productivity.

Although invasive annual plants provide spring forage for livestock and cover for watershed protection by effectively reducing raindrop energy and protecting soil from wind erosion, they affect the biological and chemical aspects of soils and long-term (more than 10 years) rangeland health. Soil disturbance resulting from livestock concentration adjacent to water sources, salting areas, and routes of travel provides increased sites for establishment of weeds and invasive species. As a result, livestock contribute to the spread of weeds through transport and defecation across the Garat allotment, especially if grazing during the critical growing season reduces the competitive potential presence of the remaining native vegetation.

Climate Change

Climate variability can directly drive soil changes where, depending on the resilience of the system, certain rangelands may be able to adapt to change by exploiting instabilities, rather than rebounding from disturbances and returning to a steady state (Walker, Ludwig, Holling, & Peterman, 1981). In some areas of the allotments, heavy grazing or lack of deferment, combined with climate change, may exacerbate the effects of drought on vegetative condition by further weakening plants, increasing invasive annual plants, accelerating shifts in plant species composition, and promoting the deterioration of soils and rangeland. Where a water-limited system is present, any reduction in the rate of water infiltration to soil is critical (Walker, Ludwig, Holling, & Peterman, 1981).

The altered future climate may not provide soil conditions that are favorable for current plant species where they presently occur; over time, these climate-induced imbalances will promote shifts and associated changes in soil conditions. At this point, global climate change does not have a clear cause-and effect-relationship with the proposed action or alternatives. Although rotational grazing may not prevent deterioration of soils and rangeland with a series of drought years, it may decrease the rate of deterioration and reduce the effects of a decline in soil quality and productivity (Teague, Dowhower, & Waggoner, 2004).

3.4.2 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 the soil affected environment for the Garat allotment as discussed above. The following 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 H – Rangeland Vegetation, as vegetation is connected to upland soils. More site-specific information for the Garat allotment is also available in the Rangeland Vegetation Section 3.3. For further discussion of processes involving upland soils and sediments and their effects on water resources, riparian areas, and wetlands, refer to Section 3.6.

3.4.2.1 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 1 and 2). 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, 2014b) and Garat Determination (Appendix F) 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 pastures 1, 2, 3, and 4 would continue to occur near annually 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 could 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 non-existent, since rest in less than the planned 1-of- 3-years cycle, as has occurred based on actual use records, are unlikely to provide adequate opportunity for recovery of plant health and vigor following repeated years of active growing season use (also see Section 3.3.2.1). 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 expected to result in an increase in 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. Such conditions make 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.

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 has 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 as the season progresses 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 2014 Rangeland Health Assessment (USDI BLM, 2014b) and Determination (Appendix F). 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. As a result, the allotment would not make significant progress toward meeting Rangeland Health Standard 1 and ORMP soil objectives 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.

3.4.2.2 **Alternative 2 Effects**

Alternative 2 would authorize a grazing schedule similar to that of Alternative 1 with periodic deferment of spring use in pastures 1, 2, 3, and 5, flexible use with rest in 1 of 5 years if deferment in 1 of 3 years does not occur in pasture 4, and summer to fall use for pasture 6. Compared to Alternative 1, initial active grazing use under Alternative 2 would be 7 percent greater in years 1 through 3, and 21 percent greater in years 4 through 10 (Appendix D – Table D-1).

In general, a portion of livestock grazing for the Garat allotment occurs during the wet spring months and the critical growing season, with uncertain periodic rest or deferment. As described under Alternative 1 and Section 3.4.1, these factors deteriorate upland soil and watershed health because they increase physical impacts to soils in the spring and early summer from hoof action, and decrease the ability of native plant communities to remain healthy, vigorous, and productive during active growth.

Although range readiness criteria would be applied under Alternative 2, physical soil impacts would increase as a result of added livestock numbers. The concentration of soil disturbance can be deemed higher for Alternative 2, compared to Alternative 1, especially when all active use AUMs are phased in after the fourth year. This also increases the risk for weed infestation and adverse impacts on soil infiltration, moisture retention, and nutrient cycling.

While an emphasis is made to avoid grazing at least once during the active growing season every 3 years in pastures 1, 2, 3, and 5, the uncertainty of providing consistent deferment or rest adds to the overall potential for adverse effects to watershed health. As a result, vegetation vigor, primarily native perennial bunchgrass reproduction and cover essential for soil stability and infiltration, is expected to remain static or decline, especially if additional growing season use occurs. These effects would be amplified if flexibility in pasture use is given, as it has been in the past (Appendix B), and as requested by allowing for grazing outside of the established parameters upon prior notification and authorized approval.

The applicant's proposed action acknowledges the potential for water shortages and, in water-short years, would result in added grazing pressure in pastures 4 and 6, which currently contain the most reliable water sources. While deferment of grazing use to a period outside the active growing season in 1 of 3 years or rest in 1 of 5 years is proposed in pasture 4, it does not provide adequate opportunity for recovery of health and vigor for native perennial species as outlined in Section 3.3.2.2.

Moreover, it is the phased increase in grazing intensity from added livestock numbers and the resulting active use that would provide little to no improvement to ecological function and site potential. Adverse effects to upland soils would be expected and be most prominent in portions of the allotment where limited water availability and topography concentrate livestock use. Soil disturbance resulting from livestock gathering adjacent to water sources, salting areas, and routes of travel would provide sites for further establishment of weeds and invasive species.

When increased fluctuations in weather patterns and drought are added, decreases in soil moisture and native vegetative cover due to altered precipitation and temperature regimes would reduce soil stability and increase the susceptibility to wind and water erosion. Additional physical livestock use effects, such as trampling, would lower the presence of protective biological soil crusts and further contribute to reduced soil productivity. With portions of the allotment not currently meeting Standard 1 already, long-term maintenance and recovery of soil, hydrologic, and biotic function are not expected, especially with an increase of 21 percent in grazing use after year 4.

The enclosures identified as Four Corners Camp West and East and Stateline Camp authorize saddle horse use and function as short-term holding facilities (see Section 1.3). The proposed addition in saddle

horse numbers and extended seasonal use to 10/15 in the existing enclosures would increase AUMs from 99 to 177 (see Section 2.2). While it is anticipated that Alternative 2 would have minimal to no additional effects based on the 2-week seasonal extension during the less impactful fall season, it is the increase in horse numbers that has the potential to adversely affect upland soils through compaction and pugging, and stocking rates that would not maintain or improve health and vigor of desirable perennial species (also see Section 3.3.2.2 Rangeland Vegetation). Soil disturbance would increase when horse use is concentrated, especially during the spring and early summer when soils can be saturated. While impacts would be reduced if light use and limited grazing during the wet season and active growing season is in place, it is anticipated that Alternative 2 would adversely impact watershed health compared to Alternative 1.

The implementation of Alternative 2 would provide little to no progress to improve ecological function and site potential. The phased increase of livestock numbers, the flexibility to graze year-after-year during the active growing season, and the collective impacts to watershed and biotic function due to altered precipitation and temperature patterns would not improve resource values. In the absence of making significant changes in season of use, grazing intensity, and utilization levels, progress toward improved soil and upland watershed resource issues and associated impacts is not expected to allow for an upward trend to positively affect soil stability, productivity, and hydrologic function over the short and long terms. As a result, Standard 1 and ORMP management objectives for watershed health and condition would not be met under Alternative 2.

3.4.2.3 **Alternative 3 Effects**

The main difference between Alternative 3 and Alternative 1 is the inclusion of performance-based terms and conditions that include upland utilization and riparian constraints (see Section 2.3; Table ALT-6), along with a slight increase in cattle numbers and AUMs. Though active use AUMs would increase by 3 percent under this alternative (Appendix D – Table D-1), this would not undermine deep-rooted perennial bunchgrass growth and vigor because their reproductive capability would be maintained by restricting utilization to slight (up to 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. The performance-based terms and conditions for vegetative stubble height within sagebrush and perennial grassland for sage-grouse upland and riparian lentic areas (see Section 2.3; Table ALT-6) would therefore also be beneficial for improving and maintaining soil stability and hydrologic function. These measures would reduce stressors to terrestrial and aquatic ecosystems and aid in adapting to changing precipitation and temperature regimes.

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. Due to the slight increase in AUMs, the concentration of soil disturbance would be higher for Alternative 3, compared to Alternative 1, which would 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. The resulting 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 and would make progress in meeting Standard 1 and ORMP soil objectives.

3.4.2.4 Alternative 4 Effects

Alternative 4 contains three sub-alternatives (4A, 4B, and 4C) that offer 2 out of 3 years of rest and/or deferment. The sub-alternatives differ in their requirement of providing either rest or deferment and identification of livestock management practices specific to riparian constraints associated with pastures 3 and 4 (see Sections 2.4 and 3.6.3.4).

Alternative 4A would provide for the greatest benefits to watershed health and include a full year of rest for pastures 3 and 4. Alternative 4B would not provide rest but includes deferment until after the active growing season for both pastures in 2 out of 3 years. Alternative 4C would include one full year of rest in pasture 3. As a whole, the rest and/or deferment rotation under Alternatives 4a, 4B, and 4C offers added benefits over all other grazing alternatives by reducing or shortening spring use and active-growing-season use in pastures 1, 2, 3, and 4. While season of use in pastures 5 and 6 would be similar to the deferment rotation in Alternatives 1 and 3, all sub-alternatives would provide added improvement to upland watersheds and soils because of a reduction in livestock numbers that decreases active use by 45 percent compared to current active use (Appendix D – Table D-1), resulting in lowered grazing intensity.

The implementation of increased rest and/or deferment during the critical growing season is expected to increase and maintain vegetative vigor of native perennials, primarily deep-rooted bunchgrasses (also see Section 3.3.2.4 Rangeland Vegetation). This would positively affect soils because improved upland vegetation communities provide added soil stability and hydrologic function, especially in years with limited soil moisture.

Since deferment during the active critical growing season occurs in 2 out of 3 years, vegetative vigor of native perennial bunchgrasses would be maintained or increased and provide for added opportunity to positively impact soil and watershed health. Grazing in pastures 1 and 2 would end after a 1-month period early in the critical growing season in 2 out of 3 years and provide opportunity for regrowth before the dormant period. Sub-alternative 4B includes deferment only and adds extended fall season use during the non-deferment year. While the extension occurs outside of spring and the critical growing season, the added rest rather than deferment under sub-alternatives 4A and 4C are more beneficial than sub-alternative 4B.

Although range readiness criteria would apply under Alternative 4, the spring and early summer grazing that occurs under the alternative would continue the potential of impacts from hoof action on wet or saturated soils as described under Alternative 1. Pastures 3, 4, 5, and 6 would benefit by only being affected once every 3 years due to deferment or rest. 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. Pastures 1 and 2 are most susceptible, with yearly early-season use and 1 out of 3 years extended use into the active growing season.

The restricted seasons and the resulting 45 percent decrease in active use AUMs (see Section 2.4 and Appendix D – Tables 1 and 2), compared to Alternative 1, would reduce intensity of grazing use and utilization levels. This, in turn, 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 or more concurrent pastures due to climatic conditions and water availability while retaining no less than 10 acres/AUM in each pasture would decrease adverse effects to hydrologic and biotic function due to lighter grazing pressure on vegetation. When combined with the reduction in active grazing use AUMs, it is anticipated that adverse effects from decreasing amounts of available soil moisture and increasing variability of precipitation from foreseeable climate change can be met with retained resistance and resilience in watershed health and conditions.

All sub-alternatives would provide for exclusion of livestock in the Piute Camp Enclosure and Piute Creek Enclosure that are associated with a portion of Piute Creek and would remove impacts to watershed health associated with seasons and intensity of livestock use. In areas where past livestock concentration occurred, adjacent upland areas would have an opportunity for recovery of soil, hydrologic, and biotic function. However, where the water gap would be used under Alternative 4C, surrounding upland soils would have the potential to experience greater localized pressure compared to sub-alternatives 4A and 4B.

The enclosures identified as Four Corners Camp West and East and Stateline Camp authorize saddle horse use and function as short-term holding facilities (see Section 1.3). Extended saddle horse use by 2 weeks to 10/15 would increase AUMs from 99 to 106 while horse numbers would remain unchanged (see Section 2.4) and as currently authorized in the existing permit. Adverse impacts to watershed function through compaction and pugging are possible, especially during the spring and early summer season when soils can be saturated. While soil disturbance would increase when horse use is concentrated, impacts would be reduced if light use and limited grazing are in place during the wet season and active growing season. It is anticipated that Alternative 4 would have minimal to no additional effects compared to Alternative 1, especially since the 2-week extension would occur during the less impactful fall season.

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.

Alternatives 4A, 4B, and 4C would allow the allotment to 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 limited 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 45 percent 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 any of the season-based sub-alternatives of Alternative 4 is expected to improve soil and upland watershed health over Alternative 1. Specifically, Alternative 4A would allow for the greatest progress toward meeting Standard 1 and ORMP management objectives for watershed health and condition, followed by Alternative 4C, then 4B. The preference of sub-alternatives 4A and 4C is due to the more frequent year-long rest provided for pastures 3 and 4 as compared to sub-alternative 4B.

Alternative 4 as a whole allows for proper nutrient cycling, hydrologic cycling, and energy flow because of limited spring season use and no grazing occurring during the critical growing season in 2 out of 3 years. Reduced levels of livestock use in all sub-alternatives would also have positive effects on soil stability, productivity, and hydrologic function over the short and long term. The resulting 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 and would make progress in meeting Standard 1 and ORMP soil objectives.

3.4.2.5 Alternative 5 Effects

Alternative 5 would eliminate all grazing in the Garat allotment for 10 years (Section 2.5) 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, which would provide additional soil organic matter. Increases in residual vegetation, energy flow and nutrient cycling, ground cover, and soil stability would be greater 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.

3.4.3 Cumulative Effects

Analysis Area and Temporal Timeframe

Soil and watershed standards and objectives are applied to activity areas, which are the 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 to the dilution effect that comes with the increased acreage.

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 are 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.

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, 2003a), 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.

Past, present, and reasonably foreseeable future activities within the analysis area relevant to cumulative effects were analyzed using approximated BLM GIS data. The Idaho Standards for Rangeland Health (Appendix A), ground cover trend (USDI BLM, 2014b), 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 aerial 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 contribute to deteriorating soil and hydrologic function. Therefore, vegetation serves as the primary indicator of upland watershed health.

Additionally, in Section 3.4.1, influences on soils from humans, general grazing, season of use, and stocking rates are discussed in greater detail. While they do not address every issue, 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. The soils and upland watershed cumulative effects analysis area is the same as the direct and indirect analysis area for which existing conditions are described in Section 3.4.1.

Analysis timeframes for cumulative effects include past and present activities that have created the present conditions, including historic grazing over the past century, and reasonably foreseeable future activities planned within the next 3 years, including the expected duration of short- and long-term 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

The CIAA for upland soils is delineated by the allotment boundaries that lie within 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-4). 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-4: Garat allotment acre distribution within watersheds

5th Field HUC	Allotment Use Acres within Watershed	Percent of Watershed Affected
Juniper Creek	42,736	100
Piute Creek	45,927	100
Red Canyon-Owyhee River	18,731	22
Yatahoney Creek- Owyhee River	14,450	24
Coyote Springs-SF Owyhee	89,822	61
Total	**211,667**	

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.

Current and past fire and fire-suppression activities have had an additional influence on the allotment. Consequently, 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 3.3 and Appendix H). 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. No wild horse Herd Management Areas are present.

Upland sediment moves across the landscape 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 3.6).

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 or make significant progress toward meeting standards are put in place to improve overall resource conditions. Additionally, the 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 and Present Activities

Data used in the following section represents the best available information. Because of the reduced reliability and availability of older or historic records, some calculations based on these data, such as wildfire, prescribed burning, recreation etc., are approximate. Table SOIL-5 attempts to serve as a quick reference that summarizes soil-specific effects to past, present, and reasonably foreseeable future actions for the soil CIAA. The terms for magnitude of upland soil effects are defined as:

- Low – activity affects only a very small percentage of upland soils in the area, or has only a temporary (fewer than 5 years) effect on soils in a larger area;
- Moderate – activity affects less than a majority of the area, or results in longer-lasting (5 to 10 years) noticeable changes to upland soil and hydrologic function; and
- High – activity affects soil and hydrologic function within the majority of the area, or has extended (more than 10 years) impacts on upland soil and hydrologic function.

Table SOIL-5: 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 over the last 27 years but likely higher in the past	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 to Moderate	Short-term, localized construction and maintenance disturbance; chronic cattle trails often compact soils along fences
Water Developments	Most constructed before 1980; few additions each decade	Minimum of 94	Distributed across analysis area, but cumulatively covering a small percentage	Low to High	Short-term, localized construction and maintenance disturbance; chronic cattle congregation trampling soils
Prescribed Burning	Mostly in 1980s	Estimated about 7,275 acres	Across target acres within the analysis area	Low to High	Pros: reduction of decadent shrubs, introduction of fire where fire regime is off; Cons: potential increase in invasive annuals, localized soil burn impacts
Wildfire & Fire Suppression	Ongoing, continuous	Approximately 55,702 acres (26 percent) burned and re-burned, primarily between 1973 and 1996	Across analysis area	Low to High	Pros: suppression maintains stabilizing ground cover on soils; Cons: long-term shift from grass/forb/shrub community to localized late seral shrub dominated areas with reduced 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	Physical soil impacts; 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 existing 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	2009	50,266 acres	Along Owyhee	Low	Vehicle restrictions

Type of Activity	Timeframe	Degree	Extent	Magnitude of Effect on Soils	Type of Effect
Designations			River corridor		reduce soil and plant disturbance; reduced potential for weed spread

Livestock Grazing: Uncontrolled 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 greater livestock numbers to increased erosion from alterations in vegetation. Restrictions and management guidelines have been implemented over the past decades that contributed to improved upland soil and vegetative conditions. Livestock grazing within the CIAA (Table SOIL-5) continues to be the dominant land use activity and occurs primarily throughout the spring and into early fall. The pressures from grazing have physical, biological, and chemical effects to soils that vary based on differences in season of use, stocking rate, and length of use (see Section 3.4.1.1).

Range Developments: Most range developments are in the form of reservoirs, troughs, and fences (Table SOIL-5). Impacts to soils are greatest when mechanical equipment is used to create or maintain reservoirs and stock tanks. Troughs are less impacting since generally a smaller area is affected. Removal and construction of exclosures and fences have impacted soil quality in the past depending on time and duration of activities; however, the disturbance is temporary and localized.

In many cases, livestock tend to congregate along fence lines so that the adjacent soils often show increased impacts. Fence lines can also accumulate weeds and add to increased fuel loads, especially in wind-prone areas. The construction of these different range improvements can add an initial short-term negative disturbance to soil quality while localized indirect impacts over small portions of the allotment can continue over the long term.

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-1; Table SOIL-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. However, the greatest threat can be associated with the establishment of invasive annuals and the consequent reduction in fire intervals that leads to repeated re-burning and loss of soil production and overall watershed health. In general, 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 within 1 to 6 years (DeBano, 1981) (Dyrness, 1976) (Huffman, MacDonald, & Stednick, 2001). The change in vegetation, however, is usually long-term.

Primary risks from fires are associated with upland water erosion from steep slopes, breaklands associated with basalt or rhyolite rims above basins, and roads, especially at stream crossings (Water Resources Section 3.6). Wind erosion can transport soil over large distances while burned and disturbed landscapes are particularly susceptible to the spread of annual grasses. Loss of soil productivity can 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 often occur and reduce potential negative effects. Grazing is usually suspended for a minimum of two growing seasons to allow vegetation to recover, which 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 effect of fire absence contributes 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 (Table SOIL-5). 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 documented exotic weed infestations in the analysis area (Table SOIL-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 limited weed infestations are anticipated to be treated include chemical treatment that would have no measurable 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 (Table SOIL-5). Depending on location, the amount of traffic that occurs on a given road, road conditions, and movement of soils, allow for sediment transport over various distances at a local or broad-scale level. This adds to localized accelerated erosion across the analysis area but cumulatively covers only 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 (Table SOIL-5). Some roads will receive little to no maintenance, especially if restricted or less used.

Recreation, OHV Use, and Other Activities: The analysis area is open for general motorized use that allows for hunting, collection of miscellaneous products, camping, and motorized touring on established roads (Table SOIL-5). Recreation has had localized resource effects by exposing or compacting soil due to 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 (Table SOIL-5). 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.

Reasonably Foreseeable Activities

Reasonably foreseeable activities on upland soils, aside from livestock grazing, are expected to increase with the ongoing threat of wildfires along with vehicular use and recreation from a growing population in the Treasure Valley to the north. Unauthorized OHV routes that illegally expand beyond existing roads and trails contribute to loss of vegetation, accelerated soil erosion, and establishment and spread of invasive and noxious weeds in the analysis area.

No State land exchange is anticipated. Grazing permit renewals are expected to maintain or improve vegetation conditions within the analysis area; no additional fences or range developments are associated with the renewal but could be addressed over the upcoming years.

The Bruneau-Owyhee Sage-grouse Habitat Project (BOSH) proposes landscape-level treatment of western juniper as it pertains to the maintenance of existing sage-grouse habitats. Scoping has been completed, although a site-specific project area has not yet been defined. The Garat allotment has no juniper issues, so it would be speculative at this time to provide analysis to a project not yet clearly defined. An EIS for the BOSH project will be prepared, with signing of the final decision anticipated in 2015.

The Tri-State Strategy project proposes planned and coordinated fuel breaks in the southwest area of Idaho, northwest area of Nevada, and southeast corner of Oregon. The treatments would compartmentalize the area and help contain large wildfires across the tri-state landscape and district boundaries, including the Garat allotment. Objectives identify road maintenance and associated mowed fuel breaks that would reduce the threat of wildfire to high value native plant communities and habitat. Initial maps (project file) have been developed but the project is still in the early stages of development so that further analysis would be speculative.

In combination, the primary past, present, and reasonably foreseeable future actions that have led toward improving watershed health and conditions include wildfire consistent with the natural fire return interval and ongoing control of noxious weeds. Actions that have led toward declining watershed health and conditions include the effects of concentrated livestock activity adjacent to rangeland developments (water development, fences), wildfire at intervals inconsistent with natural return intervals, and ongoing disturbance from roads/trails.

As a result of these limited upcoming activities, along with past and present activities described above, upland soil resources are expected to remain much as they currently are. Soils would contain mosaics of variable functionality influenced by inherent characteristics, external impacts, and depend greatly on the status of the available plant community. While localized impacts are possible, no indication of substantial change to upland soils and watersheds is anticipated within the cumulative effects analysis area from reasonably foreseeable activities.

Alternative Comparison

Grazing activities analyzed in this EA would contribute toward cumulative effects on upland soils and watersheds by incrementally influencing soil stability and hydrologic function in the Garat allotment, as described in direct and indirect effects (Section 3.4.2). The extent of the allotment's incremental additions to effects from other activities (described above) is displayed in Table SOIL-6 and is discussed below. Also included is a comparison of results for the status of meeting Standard 1 and OPRM soil objectives.

Table SOIL-6: Comparison of alternatives for AUMs and the status of meeting Standard 1 and ORMP objectives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Current Active AUMs (Baseline) 18,870 AUMs	No change	+3,880 AUMs* 21% increase	+630 AUMs# 3% increase	-8,527 AUMs 45% reduction	-18,870 AUMs 100% reduction
Standard 1 - Watershed and ORMP Objectives	Not meeting	Not meeting	Meeting	Meeting	Meeting

*final AUMs as of year 4 after a two-phase increase
with performance-based terms and conditions in place

The BLM-developed alternatives are expected to maintain or improve upland soil resources (Table SOIL-6) with additive effects from most alternatives to cumulative effects expected to be minor. The number of permitted active AUMs is used as an indicator of the extent of effects. Note that the indicators for baseline condition are active AUMs for the allotment within the cumulative effects analysis area. While livestock number would be a good measure to compare potential physical impacts, it is meaningless without including a time frame, which is provided by using AUMs.

3.4.3.1 Alternative 1 Cumulative Effects

Alternative 1 would have direct and indirect effects to upland watershed soil and hydrologic function, as described in Section 3.4.2.1. 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, flexibility in grazing use, 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 adverse 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 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.

3.4.3.1 Alternative 2 Cumulative Effects

Alternative 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, Alternative 2 would cumulatively have small incremental negative effects on upland soils and their associated processes. Under this alternative, the Garat allotment is not expected to make significant progress toward meeting Standard 1 and ORMP soil objectives over the long term.

The increase in stocking rates during the first phase of the permit, as well as the AUMs added after year 3, raises the likelihood of generating adverse impacts that would contribute to a cumulative increase in

physical soil disturbance and grazing use. Recovery of plant species composition and biodiversity of desirable key forage species would not be promoted. The subsequent reduction in soil surface protection, as well as the resulting sediment movement, have the likelihood of adding adverse effects on upland soil and watershed health and would therefore not contribute to improving upland watershed conditions.

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 conditions. 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.

3.4.3.1 Alternatives 3, 4, and 5 Cumulative Effects

Alternatives 3, 4, and 5 would have direct and indirect effects to upland watershed soil and hydrologic function as described in Sections 3.4.2.3 to 3.4.2.5. 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 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 as compared to Alternatives 1 and 2 by retaining vegetative cover and by decreasing sediment movement that would otherwise be destined to reach riparian areas and streams.

The season-based Alternative 4 and its three sub-alternatives 4A, 4B, and 4C are 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 for 2 out of every 3 years, utilize riparian exclosures that disperse cattle congregation in adjacent uplands, offer added rest (Alternatives 4A and 4C only), 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 benefits associated with the increase 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 though recovery would be highly variable and site specific. Cumulatively, alternative 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 soil objectives and cumulatively provide improvements to the CIAA.

3.5 Special Status Plant Species

A review of the Garat allotment sensitive plant species and potential habitat was completed using existing district data, communicating with BLM personnel, and preparing evaluations for the RHA. Botanical surveys have been conducted across various portions of the Garat allotment 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).

3.5.1 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*)[66], 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[67].

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 were 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

[66] Current information for this species shows no known populations of Ute ladies'-tresses occur in the Garat allotment.

[67] 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.

list, which is updated in coordination with the Idaho Native Plant Society using principles and methods from the 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[68].)

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[69] (*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 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-1: *Astragalus newberryi* var. *castoreus*

[68] The NatureServe calculator can be accessed at http://www.natureserve.org/conservation-tools/standards-methods/natureserve-core-methodology
[69] Other common names are Owyhee forget-me-not and Owyhee River stickseed.

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. Davis' peppergrass plants tend to be an extremely long-lived, slow-growing plant (Tuason, 2005). The global or state[70] 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-1: Garat special status plant occurrences by pasture

Scientific Name	Common Name	Pasture and No. of Occurrences					
		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					
Lepidium davisii	Davis' peppergrass						30

3.5.2 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 uses 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. (BLM analyzed special status plant data from 1979 to 2012 for updates) (Map SSPS-1) All other reports reviewed use best-practice science in updating rare plant occurrences.

Each plant has unique habitat needs and resilience to disturbance. In Table SSPS-2, some of the effects of livestock grazing on special status plant species habitats are listed by season of use. Plant descriptions are located in Section 3.5.3.1 above.

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

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

[70] G-3 ranking (NatureServe)

Season of Use	Issues & Impacts	
	▪ 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 • 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. BLM's analysis determined that impacts from livestock have been a factor in the deterioration of some of the playa habitats in the Garat allotment; consequently, the allotment did not meet habitat objectives associated with Standard 8 (Threatened and Endangered Plants and Animals) (USDI BLM, 2014b).

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.

3.5.2.1 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, 2014b) and the general impacts by season of use are displayed in Table SSPS-2. 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.

3.5.2.2 Alternative 2 Effects

As noted in Section 2.2, Alternative 2 is the permittee's application. SSPS resource issues are identified in the allotment assessment (USDI BLM, 2014b) 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 and increase in stocking rates during the first phase of the permit; the additional AUMs after year 3 increase the risk of deteriorating impacts. Alternative 2 would allow the operator to choose the deferment year in pastures 1-3 and 5, and the operator would have flexibility in pastures 4 and 6. When not deferred, pastures would be grazed early spring through the summer.

Alternative 2 provides no improvement over Alternative 1 and has a potential to eventually cause the amendment to fail to meet ORMP objectives 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.

3.5.2.3 Alternative 3 Effects

Previously described in Section 2.3, this alternative is performance-based and would authorize grazing with livestock numbers and grazing schedule similar to those identified in the current permit but add performance-based criteria to the existing terms and conditions. SSPS resource issues identified in the allotment assessment (USDI BLM, 2014b) 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 reduction in intensity of livestock and the more conservative less-than-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, 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.

3.5.2.4 Alternative 4 Effects

The implementation of the season-based Alternative 4 through its sub-alternatives (4A, 4B, and 4C) offers 2 out of 3 years of rest and/or deferment. The sub-alternatives differ in their ability to provide either rest or deferment and required livestock management practices specific to riparian constraints associated with pastures 3 and 4.

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 is expected to reduce utilization levels with the reduction of active AUMs.

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.

While season of use in pastures 5 and 6 would be similar to the deferment rotation in Alternatives 1 and 3, 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.

3.5.2.5 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 the plants would only be affected by weather and 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 Cumulative Effects

The cumulative analysis focuses on the aggregate effects of the past, present, and reasonably foreseeable past, present and reasonable 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 (county, city, or state), fence, or road 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 that lie within portions of the Juniper Creek, Piute Creek, Red Canyon/Owyhee River, Yatahoney/Owyhee River, and Coyote Springs/SF Owyhee watersheds for the Garat allotment EA, and includes a portion of the 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).

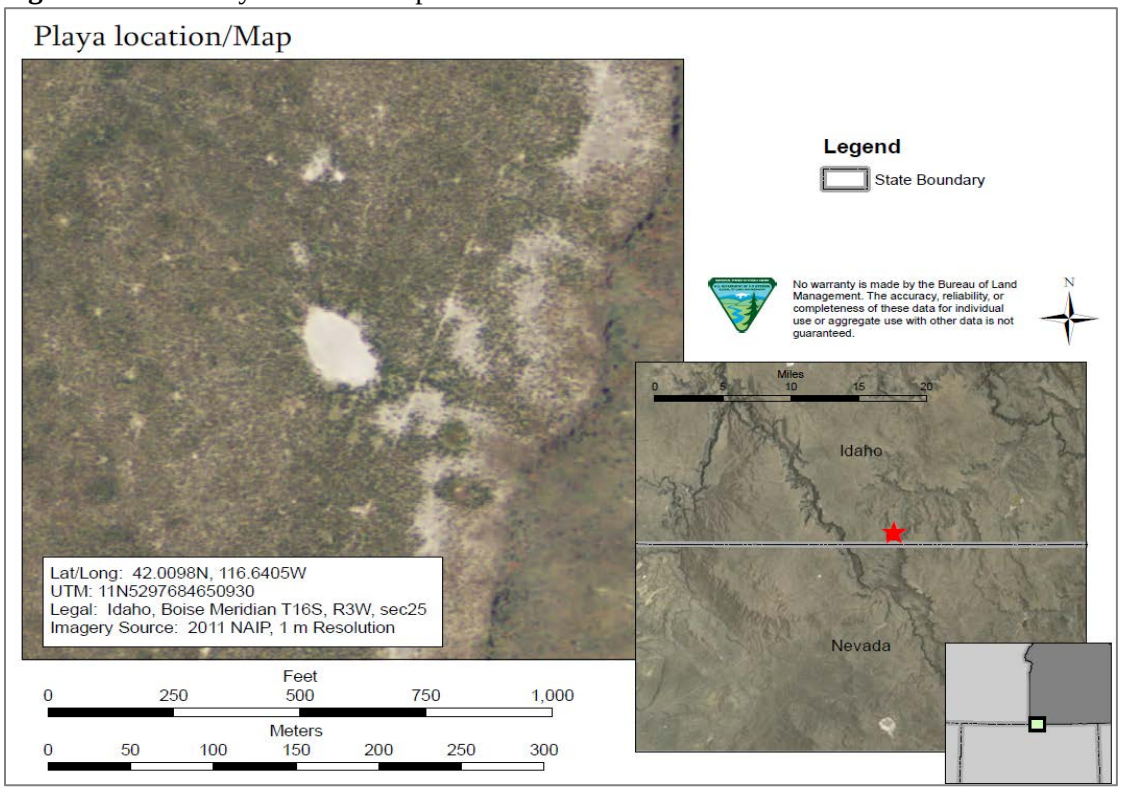
Davis' peppergrass: Davis' peppergrass is not targeted as grazing forage for livestock, but on occasion, there may be incidental consumption of the plants in the ephemerally wet playas on which it grows. Since livestock do not seek out Davis' peppergrass as grazing forage, the threat is from the trampling 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 steps that crush individual plants and cause low vitality and death. Trampling in the playas can also 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 (April-August, with flowering from May to August; it's possible each playa population may to have its own distinct fruiting and flowering time (Portland State University, 2010)) 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, 2006).

Figure SPSS-2: Davis' peppergrass, seed set (left) and flowering (right)

Figure SPSS-3: Playa location/Map: Homer Wells Reservoir West



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. The CIAA for SSPS incorporates and extends beyond the allotment boundary to capture the assessment units (plant populations) within the watershed boundaries that lie within portions of the Juniper Creek, Piute Creek, Red Canyon/Owyhee River, Yatahoney/Owyhee River, and Coyote Springs/SF Owyhee watersheds for the Garat allotment EA, and includes a portion of the Owyhee River watersheds. Data are approximate.

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

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

3.5.3.1 Alternatives 1 and 2 Cumulative 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-3. 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 little or no progress to improve 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.

3.5.3.2 Alternatives 3 and 4 Cumulative 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 (and its sub-alternatives) 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 Alternative 5 Cumulative 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.

3.6 Water Resources and Riparian-Wetland Areas

3.6.1 Background

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 allotment 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 are summarized in Table RIPN-1 and 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: 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)[71]	Season of Use	Issues & Impacts	
1, 2, 3, and 4	Spring (March- June)	▪ Soil compaction ▪ Selective grazing on palatable species	o Increased erosion o 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 o Decreased herbaceous cover o Decreased species and age diversity • 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	o 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	o Decreased tree and shrub cover • decline in stream bank stability • less shade and higher stream temperatures • loss of wildlife habitat • impaired fish habitat

[71] 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)[71]	Season of Use	Issues & Impacts	
		▪ Continuous grazing	• o Decreased species and age diversity o 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	o 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 ▪ Manure deposition in and near streams ▪ In-stream trampling and congregation	o Decreased stream bank stability o Change in channel shape, structure, and form • Reduced water infiltration • increased runoff • increased water velocity • increased flooding • reduced groundwater recharge • lowered water table • increased stream bank erosion • removal of submerged vegetation • reduced aquatic habitat • reduced fish spawning habitat o Nutrients, pathogens, and bacteria added to stream o 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

o Primary Impacts
• Secondary Impacts

3.6.2 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) (Tables RIPN-2 & 3). 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. 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.

Table RIPN-2: South Fork Owyhee sub-basin summary per IDEQ

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
Date Approved by U.S. EPA	March 2000
Watershed TMDL Approved by U.S. EPA	July 2012

Table RIPN-3: Upper Owyhee sub-basin summary per IDEQ

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
Date Approved by U.S. EPA	March 2003
Watershed TMDLs Approved by U.S. EPA	July 2012

Idaho Department of Environmental Quality (IDEQ) designates basins, sub-basins, and assessment units in order to manage the state's waterways. The 2012 Integrated Report (303(d)/305(b)) uses assessment units (AUs) within the sub-basin. Assessment units are groups of similar streams within a sub-basin that

have similar land use practices, ownership, or land management. Assessment units are assessed for pollutants and assigned beneficial uses with associated Water Quality Standards. The Beneficial Use Reconnaissance Program (BURP) is a field assessment of stream segments. Within the sub-basins and the Garat allotment, there are portions of 24 AUs that include 19.1 miles of stream that are not supporting one or more of the watershed's beneficial uses, and 423.3 miles that have not been assessed (Idaho DEQ, 2014a). However, only two of the AUs have water bodies that are not supporting beneficial uses and/or are on the 303(d) list of impaired water bodies (Table RIPN-4).

IDEQ has completed total maximum daily loads (TMDLs) for sediment and temperature for the AUs, but they continue to not support 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.

Table RIPN-4: IDEQ assessment units not supporting beneficial uses, and 303(d) listed water bodies within the Garat allotment

Assessment Unit (AU)	Miles Not Supporting	Water body Name	Beneficial Use(s)	303(d) Listed (Yes/No)	Cause for 303(d) listing
ID17050104SW005L_0L	1.9	Juniper Basin Reservoir	CWAL[1] SCR[2]	Yes	E. Coli Sediment
ID17050105SW001_06	17.2	SF Owyhee River	CWAL	No	NA

[1]Cold Water Aquatic Life
[2]Secondary Contact Recreation

Based on the National Hydrography Dataset (NHD), riparian and water resources within the allotment include more than 500 miles of intermittent and ephemeral streams (about 4.5 miles support riparian vegetation (USDA FSA, 2011)), and numerous man-made reservoirs (Table RIPN-5). 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-5: 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

This EA and the resource objectives refer 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[72] proper functioning condition (PFC)[73] 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 – Streams and Springs

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 evaluates and assesses the soils and hydrologic function of these areas.

Overall, streams and springs that support riparian areas are scarce 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.

Pasture 1 - Dry Lakes
According to the NHD, pasture 1 of the allotment contains approximately 40.75 miles of intermittent streams and six range improvements (reservoirs) (Table RIPN-5). 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 of the allotment contains 63.6 miles of intermittent streams and eight range improvements (reservoirs) (Table RIPN-5). A majority of the streams in pasture 2 are ephemeral and do not support riparian-wetland areas. However, approximately 2.5 miles of Piute Creek support intermittent segments of hydric soils and riparian vegetation.

Two reaches of the creek that traverse pasture 2 were assessed using the PFC protocol in 2014 and both were rated FAR (Figure RIPN-1; Map RNGE-4). Although the stream has a history of surface water and

[72] Lotic = flowing water. Lentic = standing water, e.g. a seep, spring, or pond.
[73] PFC Assessments are based (USDI BLM, 1998a) and (USDI BLM, 1998b)

flow, the system's water currently is being supplied by the water table and subsurface, seasonal springs. There is a lack of a stream channel with a discernable bed and bank morphology. Thus, the reaches were assessed using the lentic PFC protocol. Both reaches are being influenced by the upstream reservoir, prolonged drought, livestock use, and a lowered water table. The stream continues north to the confluence with the Owyhee River for an additional 0.6 mile, but the reach is in a steep canyon and is inaccessible to livestock.

Reach 05072014PiuteCreekR2 (Figure RIPN-1) flows from the fence line between pastures 2 and 4 for about 0.6 mile north, and is composed of a series of perennial pools with scoured ephemeral areas between them. The reach was rated FAR primarily due to a lack of desirable riparian plant species and the presence of mechanical damage from livestock. The wetland areas are stable but are not at their full potential because the mechanical damage is resulting in areas of scour, erosion, and bare ground. Consequently, there is inadequate cover of deep-rooted hydric plant species to dissipate energy and protect the system.

The northernmost reach (05072014PiuteCreekR3; Figure RIPN-1) is a complex of seasonal pools about 1.8 miles in length, and the associated wet meadow occurring intermittently with dry ephemeral segments. The assessment rating and indicators apply only to the hydric segments. The PFC protocol is not appropriate and does not apply to the ephemeral segments, which are assessed and managed as uplands. The hydric segments are being impacted by mechanical damage from livestock and the impacts are being compounded by the influences of a prolonged drought. The water table is being lowered affecting the presence and composition of riparian plant species. The system has potentially transitioned to species that are more tolerant of drier conditions, and the reach contains primarily one hydric species of *Juncus*, with upland species occurring in the riparian zone. The creek occurs in a low-gradient valley bottom, and over the long term, the extent of the wetland area is diminishing. In the short term, the wet meadow areas appear stable, but they are not at their full potential. In other words, the riparian area is shrinking. Scouring, bare ground, and erosion are occurring as a result of discontinuous cover of deep-rooted riparian plants that would dissipate energy and protect against vulnerabilities.

Pastures 3 and 4 - Forty-Five Field & Kimball

According to the NHD, pasture 3 of the allotment contains 171.8 miles of intermittent streams and 24 range improvements (reservoirs). Pasture 4 of the allotment contains 113.9 miles of intermittent streams, and 24 range improvements (reservoirs) (Table RIPN-5). Most of the streams in pastures 3 and 4 are ephemeral and do not support riparian-wetland areas.

Approximately 1.6 miles of Piute Creek (05062014PiuteCreekR1; Figure RIPN-1) north of the Piute Basin Reservoir were assessed in 2014 and were found to be FAR (Maps RNG-3- and RNGE-4). Portions of the reach traverse both pastures 3 and 4. The creek occurs in a low-gradient valley bottom, and over the long term, the extent of the wetland area is diminishing. In the short term, the wet meadow areas appear stable, but they are not at their full potential. Scouring, bare ground, and erosion are occurring as a result of mechanical damage and discontinuous cover of deep-rooted riparian plants that would dissipate energy and protect against vulnerabilities. The composition of riparian vegetation is dominated by one species (*Juncus*) that has low vigor and is contributing to the degradation of the riparian community. *Juncus* is not the highest value riparian species in terms of providing deep binding roots that stabilize soils, and it is currently the only hydric species present.

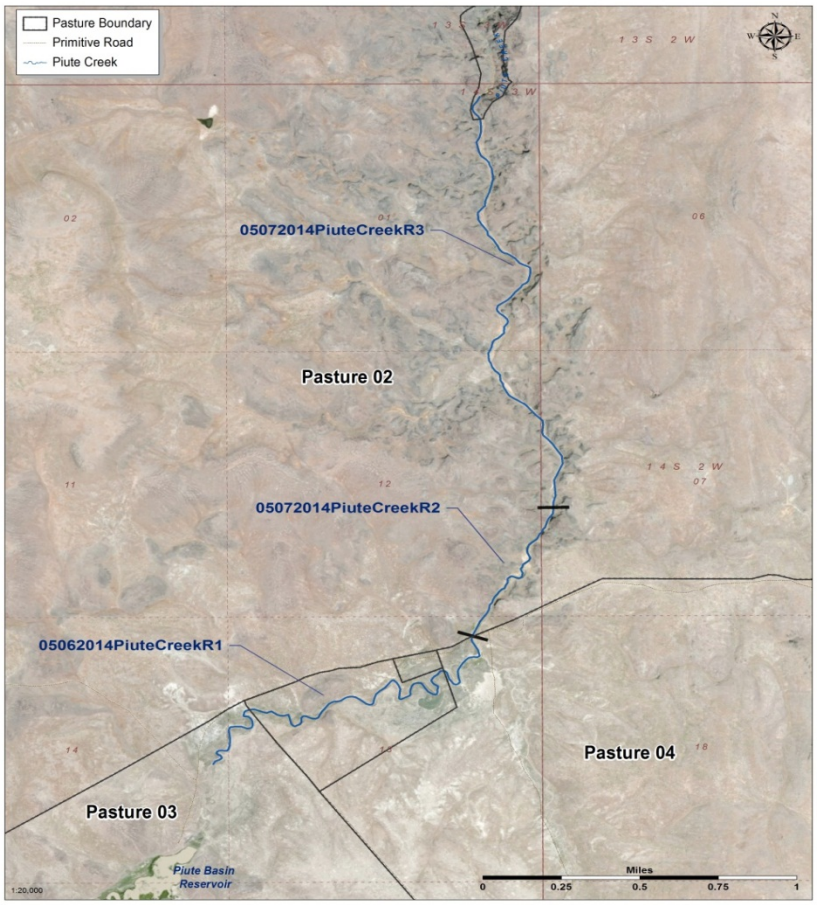
In 2003, two of the reservoirs/springs in pasture 4 were assessed as non-functioning (Map 7). However, the PFC protocol used to assess the springs is not appropriate based on the reservoir nature of the water developments. The intent of the PFC protocol and the indicators used to assess functional condition of riparian/wetland areas are not appropriate for manmade and altered water developments (e.g., reservoirs)

that have transitioned beyond the form associated with a natural wetland area. There are numerous reservoirs within the allotment that were not assessed for this reason.

Pasture 5 - Big Horse
According to the NHD, pasture 5 of the allotment contains 104.8 miles of intermittent or ephemeral streams, five springs, and 10 range improvements (reservoirs) (Table RIPN-5). The streams in pasture 5 are ephemeral and do not support riparian-wetland areas. None of the streams or springs identified in the NHD has been assessed.

Pasture 6 - Juniper Basin
According to the NHD, pasture 6 of the allotment contains 157.8 miles of intermittent streams and 12 range improvements (reservoirs) (Table RIPN-5). Most of the streams in pasture 6 are ephemeral and do not support riparian-wetland areas.

Figure RIPN-1: Piute Creek



Current Condition – Water Quality

Pastures 1, 2, and 4
None of the streams in pastures 1, 2, or 4 have been assessed by IDEQ, nor are they on the 303(d) list of impaired waters. The BLM does not have any water-quality monitoring sites in these pastures.

Pastures 3 and 5
Approximately 17.2 miles of the SF Owyhee River that occur within pastures 3 and 5 are not supporting the cold-water aquatic life beneficial use assigned to the South Fork Owyhee Watershed . However, since a TMDL has been developed and accepted, the stream has been removed from the 303(d) list of impaired waters (Table RIPN-4).

Pasture 6
Juniper Basin Reservoir is the only water body within the pasture discussed in the 2012 integrated report (IDEQ). The reservoir was not supporting the beneficial uses assigned to the Upper Owyhee Watershed. The uses are cold water aquatic life and secondary contact recreation, and the pollutants identified are sediment/siltation and E.coli (Table RIPN-4 and Map RIPN-1). A TMDL has been developed and accepted for sediment, but not for E.coli; therefore, the reservoir remains on the 303(d) list. However, in the 5-year review published in 2009, the department questioned the appropriateness of the designation (IDEQ 2009, Five Year Review).

3.6.3 Direct and Indirect Effects

3.6.3.1 Alternative 1 Effects

As a result of the current use, Rangeland Health Standard 2 associated with the riparian-wetland resources is not being met (USDI BLM, 2014b). Implementation of Alternative 1 (for details, see Section 2.1 and Appendix D), would allow the maximum actual use reported over the past 10 years. Under this grazing scheme, the pastures (2-4) that contain riparian and water resources would remain the same or incur additional negative impacts because the permit would allow the same or similar seasons of use and would allow for a 27 percent increase over the average actual use. The impacts by season of use are displayed and identified above in Table RIPN-1 (Section 3.6.2).

The water and riparian resources are scarce in the Garat allotment and occur in small areas of pastures 2, 3, and 4 (Maps RNGE-2 through 4). 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, cooler temperatures and green upland forage disperse livestock, decreasing the compounding impacts associated with livestock congregating in the riparian areas (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 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.

In addition to the spring use, pasture 4 would continue to be grazed into the early summer for 2 of the 3 year 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, when riparian areas are open to grazing 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-1). 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).

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, 4.5 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.

If Alternative 1 were implemented, the riparian and water resource issues and associated impacts would remain similar to the current condition, and Rangeland Health Standard 2 as well as the ORMP objectives would not be met.

3.6.3.2 Alternative 2 Effects

Alternative 2 (for details, see Section 2.2 and Appendix D) would allow the operator to choose the deferment year in pastures 1-3 and 5; the operator would have flexibility with pastures 4 and 6. When not deferred, pastures would be grazed early spring through the summer, and the operator would have flexibility to allow fall use with pastures 4 and 6. Additionally, over the first 5 years of the 10 year permit, the active use would increase 37 percent. Consequently, the riparian-wetland areas and stream channels would incur grazing during the most vulnerable time period, often resulting in heavy use of both the herbaceous and woody riparian plant species (Elmore W. , 1994). Furthermore, as described in detail under the 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 continue to degrade the riparian and water resource condition. Approximately 4.5 miles of stream that support riparian vegetation would be impacted by both spring and summer grazing, as described above under Alternative 1. Thus, the Idaho Rangeland Health Standard 2 associated with the water and riparian resources and the ORMP objectives would not be met under this alternative.

3.6.3.3 Alternative 3 Effects

Implementation of Alternative 3 (for details, see Section 2.3 and Appendix D) would include performance-based terms and conditions that were developed for 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 use 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 riparian-wetland edge 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 progress toward 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 as described under Alternative 1 and in Table RIPN-1. 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 riparian-wetland edge alteration standard would lessen the floodplain and in-stream trampling impacts and associated resource consequences. The direct sloughing and shearing of riparian area soils would improve and the erosion rates, and thus sedimentation, would decrease.

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 term and condition (#13) is met. The alternative could result in an improvement for the riparian and water resource (4.5 miles of stream that support riparian vegetation) and the Rangeland Health Standards 2 associated with the resources would make progress towards being met. Additionally, over time, the ORMP objectives would make progress towards being met.

3.6.3.4 Alternative 4 Effects

Water and riparian resources are scarce in the Garat allotment, and those the BLM manages are associated with Piute Creek in small areas of pastures 2, 3, and 4 (Maps RNGE-2 through 4). Alternative 4 (for details, see Section 2.4) contains three sub-alternatives 4A, 4B, and 4C (Appendix D) that offer 2 out of 3 years of rest and/or deferment. The sub-alternatives differ in their means of accomplishing either rest or deferment and required livestock management practices specific to the riparian constraints associated with pastures 3 and 4. However, the three sub-alternatives all provide a 47 percent reduction in active AUMs compared to the current permit along with the various methods of meeting the riparian constraints. Additionally, the three sub-alternatives all exclude livestock from pastures 7 and 8 that enclose approximately 80 percent of the segment of Piute Creek that traverses pasture 4. Overall, alternatives 4A, 4B, and 4C would result in improvements to the riparian-wetland areas that occur within pastures 2-4, and progress toward meeting Idaho Rangeland Health Standard 2 and accomplishing the riparian ORMP objectives would occur more quickly than under Alternatives 1-3.

Alternative 4A

Under Alternative 4A, the riparian constraints that restrict grazing during the summer months (July-August) would be applied to the three pastures that contain portions of Piute Creek (2-4). Pasture 2 would be grazed during the spring months over the 3-year 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 aquatic habitat.

Pastures 3 & 4 would be rested one year, grazed during the spring one year (see impacts above), and grazed during the summer and fall (7/1 to 10/15) during 1 of the 3 years of the cycle. When grazed during the warmer summer months, upland grasses are often dry, and 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-1). 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 bacteria concentrations (Taylor, Gillman, & Pendretti, 1989).

Overall, implementation of Alternative 4A that provides rest and/or deferment 2 in 3 years in the riparian pastures would reduce the impacts on the riparian and water resources, and both the rangeland health Standards 2 and the riparian ORMP objectives would make progress towards being met. This sub-Alternative would have the greatest benefit for the riparian areas as compared to Alternatives 1-3, 4B, and 4C.

Alternative 4B

Under Alternative 4B, pasture 2 would be treated the same as described under Alternative 4A. Pastures 3 and 4 would be grazed during the summer and fall for 2 years and season-long during the third year of a 3-year cycle. A term and condition of the permit would require the use of livestock management practices (e.g., herding, salt and supplement placement, and livestock movement) to control the timing and location of grazing use and to implement the riparian constraints (Table ALT-10). Thus, the impacts within pasture 2 would be the same as described under Alternative 4A. Full implementation of management practices that enforce the riparian constraints (i.e., herding cattle away from riparian areas during the summer months) would accomplish the same level of improvement as that described under Alternative 4A. However, there are no quantitative metrics such as those proposed under the terms and conditions of Alternative 3 that would monitor the riparian-wetland areas condition. The defined seasons of use that prohibit grazing during the vulnerable time periods as proposed under Alternative 4A would allow for more confidence related to riparian area improvements.

The implementation of Alternative 4B 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 and if the associated terms and conditions are met, implementation of this alternative would result

in an improvement for the riparian and water resources, and progress would be made towards meeting Standards and ORMP objectives as compared to Alternatives 1-3 and 4C.

Alternative 4C

Under Alternative 4C, pastures 2 and 3 would be treated the same as described under Alternative 4A. Within pasture 4, the enclosure delineated by pastures 7 and 8 would be used to exclude livestock from approximately 80 percent of the segment of Piute Creek that occurs within the pasture. The remaining 20 percent or approximately 0.3 mile of stream would be managed as a water-gap and livestock access to this reach would be allowed. The 0.3-mile reach of Piute Creek within pasture 4 defined as the water gap would not have management actions applied to meet the ORMP objective, or the Idaho Standard for Rangeland Health 2 for the riparian-wetland areas. The pasture would be grazed season long for one year, and during the summer and fall for 2 out of 3 years. The impacts associated with summer and fall use would be the same as described under Alternative 4A. The 0.3-mile water gap in pasture 4 would be grazed mid-summer every year under Alternative 4C as compared to only 1 year of each 3 year cycle under Alternative 4A. Because this portion of stream is not a hardened area (it is not comprised bedrock), there would be potential impacts both up and down stream of the water gap in terms of sediment and down-cutting. Additionally, in recent years, there is evidence that suggests that the 0.3 mile that would constitute the water gap will not provide livestock water later in the summer season.

Overall, the riparian areas located outside of the enclosures would benefit more under this alternative than Alternative 1-3, but would not result in more benefits than Alternatives 4A and 4B. The riparian and water resource Idaho Rangeland Health Standard 2 and the ORMP objectives would make progress towards being met.

3.6.3.5 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 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). 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. The riparian and water resource Idaho Rangeland Health Standard 2 and the ORMP objectives would make progress towards being met.

3.6.3.6 Direct and Indirect Effects Alternative Summary

Implementation of Alternative 5 would have the most and the fastest beneficial effects or the riparian and water resources. The season-based Alternative 4 and its three sub-alternatives 4A, 4B, and 4C that all utilize riparian exclosures that would prohibit livestock use within pastures 7 and 8 and would reduce stocking rates that further decrease grazing impacts are expected to have similar positive effects. However, because within pastures 2-4, Alternative 4A would also restrict grazing during the riparian areas vulnerable time for 2 out of every 3 years, it would have more beneficial effects than Alternatives 1-3, 4B, and 4C. Alternative 4B that would utilize management practices that enforce the riparian constraints (i.e., herding cattle away from riparian areas during the summer months) that disperse cattle congregation into adjacent uplands and offers added rest would have more beneficial effects than Alternative 1-3, and 4C. Alternative 4C that allows grazing in a defined water gap in pasture 4 would have more beneficial effects than Alternatives 1-3. Alternative 3 that would require monitoring terms and conditions for riparian areas would have more beneficial effects than Alternatives 1 and 2. Alternative 1 that would implement the maximum actual use as the permits active AUMs, would avoid riparian pastures 2 and 3 during the summer months, and would offer some rest would have more beneficial effects that Alternative 2.

3.6.4 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 or watersheds (Table RIPN-6, Map CMLV 1) that incorporate and extend beyond the allotment boundary. The watersheds comprise 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.

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 (Map RIPN-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.

Table RIPN-6: 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

4th Field HUCs (sub-basins)	5th Field HUCs (watersheds)	Watershed Acres
	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-7: 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: 7 processed as part of the Owyhee 68; 6 to be processed by 2015.
Wildfire	113,151 acres (between 1973-2011)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)	13,533 acres (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 have historically been primarily grazed throughout the spring and summer. Seven of the allotments that fall within the CIAA have had final decisions issued as part of the Owyhee 68 stipulated agreement, and the final decisions contain substantial changes in both season of use and number of livestock.

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-8. 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-8: 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 the 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 experience increased 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-1 through 6 (Idaho DEQ, 2014b)). 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.

Most streams and springs within the analysis area have been influenced by various land use activities, including livestock grazing. Some of the streams within the analysis area, including the SF Owyhee River, are not meeting IDEQ water quality standards, primarily due to sedimentation. Tables RIPN-7 and RIPN-8 provide an overview and the pollutants of concern for the Upper Owyhee River and the SF Owyhee River sub-basins.

3.6.4.1 Alternatives 1 and 2 Cumulative Effects

Alternatives 1 and 2 would directly and indirectly effect the Garat allotment in similar ways (see details in Sections 3.6.2.1 and 3.6.2.2). 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 as compared to the average actual use, 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).

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 these 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 conditions 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.

3.6.4.2 Alternative 3 Cumulative Effects

The direct and indirect effects described in Section 3.6.2.3 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 activities 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.

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.

3.6.4.3 Alternative 4 Cumulative Effects

As described above in the direct and indirect effects Section 3.6.3.4, Alternative 4 would implement various methods to prohibit summer/growing season grazing in the riparian pastures 2 of every 3 years, which would partially eliminate the impacts on the riparian and water resources because the direct removal of riparian vegetation and stream trampling would be minimized.

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. Over the long term, (10 or more years) 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 season-based Alternative 4 and its three sub-alternatives 4A, 4B, and 4C all utilize riparian exclosures that prohibit livestock use within pastures 7 and 8 and result in reduced stocking rates that are further decreasing grazing impacts are expected to have similar positive cumulative effects. However, Alternative 4A would also restrict grazing during the riparian areas vulnerable time for 2 out of every 3 years, so it would have more beneficial effects than Alternatives 4B and 4C. Alternative 4B that would utilize management practices that enforce the riparian constraints (i.e., herding cattle away from riparian areas during the summer months) that disperse cattle congregation into adjacent uplands and offers added rest would have more beneficial effects than Alternative 4C. Alternative 4C that allows grazing in a defined water gap in pasture 4 would have the least beneficial effects of the 3 sub-alternatives.

The impacts on the water-riparian resources from the actions under Alternative 4 that would occur within the allotment would be added to the impacts from the other CIAA 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. Alternative 4 would provide additional protection and have more beneficial effects compared to the implementation of Alternatives 1, 2, or 3.

3.6.4.4 Alternative 5 Cumulative Effects

The cumulative impacts of Alternative 5 that combine extended rest from livestock grazing within the Garat allotment with 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 and ORMP objectives. 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. Implementation of Alternative 5 would have the most beneficial effects.

3.7 Wildlife/Wildlife Habitat and Special Status Animal Species

3.7.1 Affected Environment

Descriptions of the current condition of species and their habitats within the Garat allotment are based on the 2014 Rangeland Health Assessment and Evaluation Report (USDI BLM, 2014b) and Determination (Appendix F), affected environments of the Rangeland Vegetation and Water and Riparian Resources within this EA (Sections 3.3.1 and 3.6.2, respectively), recent personal observations, current element occurrences in IFWIS (IDFG, 2011), and consultation with local wildlife professionals.

Wildlife Habitat

Recent and historical wildfires have modified wildlife habitats extensively within the Garat allotment (Map FIRE-1). 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.

The Garat allotment is located within the Dissected High Lava Plateau Level IV Ecoregion (Map WDLF-1; (McGrath, et al., 2002)). 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). Stands of greasewood are found along some intermittent drainages in the Garat allotment. 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 riparian habitat (Table WDLF-1; Map WDLF-2). Upland and riparian vegetation within the allotment have been discussed in detail in Sections 3.3 and 3.6.

Table WDLF-1: 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. 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 2014 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.

Uplands

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 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, 2014b). 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, 2014b)) 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). Piute Creek is located in the north central portion of the allotment (Map WDLF-1), and was assessed as a lentic system in 2014 and found to be functional-at-risk

in pastures 2, 3, and 4. 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.

Many wildlife species utilize a variety of habitats in the Garat allotment. These habitats provide forage, nesting substrate, and cover for a variety of bird and mammal 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.

Wildlife Species

Although no threatened and endangered species listed under the Endangered Species Act (ESA) occur in the Garat allotment, one candidate species in consideration for listing from the U.S. Fish and Wildlife Service's (USFWS) Endangered Species Program (USDI USFWS, 2011) was identified as occurring on the allotment. 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, 2003) 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 species is listed as a candidate under the ESA, and 10 mammal, 13 bird, one reptile, and two amphibian species with special status potentially could occur within the Garat allotment and may be affected by the current action. Common and scientific names of special status wildlife species, their status, and occurrence potential within the Garat allotment are summarized in Appendix G.

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 Garat allotment 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 and pygmy rabbit.

The USFWS has determined that greater sage-grouse warrant listing under ESA (i.e., candidate species) but have been precluded due to higher priorities. The Idaho BLM has determined that pygmy rabbit is 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 Garat allotment, 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). 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. Candidate species are considered BLM Sensitive Species and their habitat is managed to prevent the need for listing under the Endangered Species Act (USDI BLM, 2008) . 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 Garat allotment is 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 Garat allotment (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 Garat allotment 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 Garat allotment encompasses large and contiguous areas of PPH (Map WDLF-3).

Typically, sage-grouse in the vicinity of the Garat allotment congregate on communal strutting grounds (i.e., leks) from March to early May. Nesting occurs between April and June. Broods remain with females for several 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 Garat allotment to varying degrees.

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 preliminary general habitat (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-2; Map WDLF-5). There are substantial amounts of PGH in areas of historical burns within pastures 3, 4, 5, and 6 (Map WDLF-5).

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-2: Sage-grouse habitat acreage within Garat allotment, 2012

Pasture	Preliminary Priority Habitat (PPH)			Preliminary General Habitat (PGH)
	Sagebrush	Perennial Grassland	Total	
1	14,856	6	14,863	325
2	12,673	7,482	20,155	244
3	39,254	304	39,559	5,017
4	26,357	7,955	34,312	6,744
5	32,671	172	32,843	6,183
6	27,383	15,134	42,517	8,903
Total (% of allotment)	153,195 (72 %)	31,054 (15 %)	184,249 (87 %)	27,416 (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, 2014b). 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-5). Occupied lekking areas and incidental observations indicate that sage-grouse occur within the allotment throughout the year ((IDFG, 2011) 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 are comprised of PPH-sagebrush (Map WDLF-5). Although a substantial portion of pasture 2 (approximately 37 percent) is classified as PPH-perennial grasslands (Table WDLF-2; Map WDLF-5), recovery of the native plant community is occurring ((USDI BLM, 2014b). 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, 2014b). 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-5). 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, 2014b). 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). A PFC assessment of Piute Creek in 2014 found that hydric vegetation was limited in abundance and diversity (primarily one species, Baltic rush) and that erosion and hoof action were reducing the stability and vigor of the system (USDI BLM, 2014b). 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-5).

Pastures 3 and 4 also are comprised primarily of PPH-sagebrush (Map WDLF-5). A minor portion of pasture 3 is classified as PPH-perennial grasslands (Table WDLF-2), whereas approximately 19 percent of pasture 4 falls in the PPH-perennial grasslands category (Table WDLF-2; Map WDLF-5). Both pastures also have areas of PGH (approximately 11 and 16 percent in pastures 3 and 4, respectively; Table WDLF-2; Map WDLF-5). 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, 2014b). Overall, breeding habitat conditions within these pastures are predominantly rated unsuitable (USDI BLM, 2014b). 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, 2014b). 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, 2014b). 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, 2014b) 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-5). Piute Creek, Piute Reservoir, other small reservoirs, and these swales retain mesic conditions for brood-rearing habitat longer than surrounding upland areas in pastures 3 and 4 (USDI BLM, 2014b). 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, (Section 3.5.4.1; (USDI BLM, 2014b)). 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 are comprised of PPH-sagebrush (Map WDLF-5). A very minor portion of pasture 5 is classified as PPH-perennial grasslands (Table WDLF-2), whereas approximately 29 percent of pasture 6 falls in the PPH-perennial grasslands category (Table WDLF-2; Map WDLF-5). Both pastures also have areas of PGH (approximately 16 and 17 percent in pastures 5 and 6, respectively; Table WDLF-2; Map WDLF-5). 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, 2014b). Overall, breeding habitat conditions within these pastures are currently rated as marginal (USDI BLM, 2014b). 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, 2014b). 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-5). 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 5 and 6 (USDI BLM, 2014b). 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, 2014b).

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 3.3.1). 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-3: 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

Lek	Location	Survey Year[2]					
		2012	2011	2010	2009	2008	2007
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 (Idaho Sage-grouse Advisory Committee, 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
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 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, 2006).

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, USDI BLM, unpublished data). 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-1). 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)

A variety of special status bird species occur or are likely to occur within the Garat allotment (Appendix G). 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.

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 Garat allotment may provide foraging and nesting habitat for up to 177 additional species of migratory birds (Appendix G).

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 Garat allotment falls within the Great Basin BCR. In addition, the Garat allotment is 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 G).

The nesting requirements of many migratory birds are fulfilled within the Garat allotment 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. Grasslands and shrub steppe provide nesting and foraging habitat for the majority of migratory bird species within the Garat allotment. 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 Garat allotment (Appendix G). The rock outcrops, and shrub steppe located within the Garat allotment 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 Garat allotment 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 Garat allotment. 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.

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.

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.

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).

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)

Special status bat species occurring or potentially occurring within the Garat allotment include fringed myotis, spotted bat, and Townsend's big-eared bat. Although these species have been detected in the

general area around the allotment, 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.

Large predators that occur within the Garat allotment 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.

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. 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).

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. 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 canyon lands within the allotments. Similarly, pronghorn occur year-round throughout the uplands in Garat allotment. 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.

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 SMA-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. 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, 2010d). 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, 2010d).

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. 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). Because the allotment is located at the northern extent of these species' ranges, occurrence within suitable lower elevation habitats is possible.

Amphibians and Reptiles (including Special Status Species)

The western toad and common garter snake have the potential to occur within the Garat allotment (Appendix G). These 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 and reptile populations in the Garat allotment, individual species will not be discussed in detail further. Amphibian and reptile habitat in general will be included in the broader context of upland and riparian habitat conditions.

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).

According to the ORMP, 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).

3.7.2 Direct and Indirect Effects

General impacts from livestock grazing on upland habitats

Active-growing-season use

Grazing upland habitats during the active growing season can have multiple impacts to wildlife habitats. Deep-rooted perennial grasses and forbs exhibit reduced growth and reproduction the year of and the year following clipping during the active growing season (Blaisdell & Pechanec, 1949), (Mueggler, 1975). These grasses are most sensitive to grazing during the boot stage when seedheads are beginning to form (Blaisdell & Pechanec, 1949). Heavier use in the growing season resulted in lower vigor the following year (Mueggler, 1975). Plants with low vigor likely require multiple years of recovery before producing a similar amount of seedheads as plants with high vigor (Mueggler, 1975). A review of the literature by Anderson (1991), pertaining to the effects of defoliation and vigor recovery of bluebunch wheatgrass, and research by Ganskopp (1988), pertaining to similar effects to Thurber's needlegrass, revealed a high sensitivity to clipping during the active growing season. Clipping that occurred when the plant was entering the boot stage, which is a period early in its seed producing stage of growth, was the period of highest sensitivity and resulted in the greatest reductions of herbage and root production. Deep-rooted perennial grasses like bluebunch wheatgrass and Idaho fescue are the grasses that typically provide sufficient herbaceous cover for sage-grouse while shallow-rooted grasses like Sandberg's bluegrass typically do not to provide adequate cover. Connelly et al. (2000) acknowledges that sites dominated by short statured grass may not be able to provide the seven inches that is recommended during the spring nesting season. In sites dominated by short statured bluegrass Cagney et al. (2010) recommended managing for high vigor to provide at least some herbaceous cover. If deep-rooted perennial grasses are still present, on a site even in lower abundances, managing for high vigor provides the opportunity for them to reproduce and increase in abundance and increase cover.

Grazing upland shrub steppe habitats can reduce hiding and nesting cover and forage available for wildlife species by reducing the vigor and abundance of perennial grasses and forbs. Reduced forage requires a species to travel further to find sufficient food. Reduced cover makes nests, burrows, or other cover locations more visible to predators. Decreased forage and cover can increase predation on nests, broods, and individual animals. Sagebrush, the dominant shrub in shrub steppe habitats, is relatively ungrazed by livestock grazing, but it can be trampled. Generally, the cover and forage provided by sagebrush to wildlife remain more constant than that of grasses and forbs, but sagebrush by itself is not adequate to provide for most shrub steppe wildlife species. The active growing season is also the time when many wildlife species are reproducing, so having habitats with sufficient forage and cover is critical during this time.

Deferment

Deferment involves delaying grazing in a pasture until after the seed of the key forage species matures (Holechek, Pieper, & Herbel, 1998). Deferment during the active growing season allows upland vegetation to complete its annual growth and reproduction cycle without disturbance from livestock. Perennial grasses and forbs are able to replenish and develop their root system and store energy. Seedlings are able to become established and develop an adequate root system to survive the winter. Deferment allows perennial grasses and forbs to regain vigor that is lost from grazing during the active growing season in previous years. Plants with high vigor can break dormancy earlier, get taller, and produce more seed than plants with low vigor.

Deferment would provide increased cover and forage for wildlife and those that breed or have young in the spring and early summer would have reduced disturbance and or competition from livestock.

Fall and winter use
Grazing after the active growing season has little effect on the vigor and reproductive capability of bluebunch wheatgrass (Blaisdell & Pechanec, 1949). By early fall, upland plants have typically completed most or all of their growth for the year and are beginning to become dormant, and light to moderate grazing has little effect on the vigor of the plant. However Sauer (1978) found that the removal of all standing herbage from dormant bluebunch wheatgrass in the winter reduced herbage production the following year.

Rest
Rest involves not grazing a pasture or allotment for an entire year and provides more time for plants to recover from past grazing influences compared to deferment (Holechek, Pieper, & Herbel, 1998). Like deferment, rest allows upland vegetation to complete its annual growth and reproduction cycle without disturbance from livestock, but rest also ensures that the residual cover remains through the fall and winter. Rest would allow wildlife to breed, reproduce, and raise young without competition or disturbance from livestock. Habitats would provide more cover and forage thus increasing reproductive success.

General impacts from livestock grazing on riparian habitats

Riparian hot-season use (July 1 – Sept 15)
Livestock spend more time in riparian habitats in the mid-summer (around July 1 – Sept 15) when temperatures are the highest (Parsons, Momont, Delcurto, McInnis, & Porath, 2003). 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 over dry upland vegetation (Powell, Cameron, & Newman, 2000), (Bailey & Brown, 2011). Impacts to riparian vegetation from grazing during the hot season are going to be more severe than the impacts to upland vegetation. In semi-arid rangelands where forage growth is limited primarily by precipitation, ensuring that riparian area grazing does not occur during the critical late summer period may be more beneficial than rotational systems that defer livestock use throughout the grazing season (Bailey & Brown, 2011). A fall system of grazing would be beneficial for the improvement of the riparian areas when stream bank temperatures are cool enough to discourage animals from congregating in the riparian areas (Bellows, 2003).

Livestock grazing in riparian habitat can reduce vegetation and modify stream banks causing erosion (Kauffman, Krueger, & Vavra, 1984). Vegetation loss, both from grazing and from erosion, decreases shading, which results in higher water temperatures. Vegetation loss also reduces forage and cover for wildlife in riparian habitats. Trees, shrubs, and herbaceous vegetation form multi-layered complex habitats in riparian areas that provide a wide range of niches for aquatic and terrestrial wildlife species. The loss of any component of a riparian area can reduce cover and forage for some wildlife species. Portions of the vegetation within riparian habitats may be removed by flood events. However, as long as the vegetation has the opportunity to establish, grow, and reproduce on a regular basis, they can maintain these complex riparian habitats. Grazing riparian habitats every year for extended periods during the hot season typically results in overutilization of herbaceous and woody vegetation, which reduces the vigor and reproductive capability of existing plants and inhibits the establishment of seedlings.

General impacts from livestock grazing on sage-grouse habitats

Livestock can interact with sage-grouse and alter their habitat in several ways. Livestock can flush sage-grouse hens from their nests, which may increase the risk of nest predation or abandonment (Coates, Connelly, & Delehanty, 2008) and (Coates & Delehanty, 2010). One cow has been observed eating a sage-grouse egg from the nest (Coates, Connelly, & Delehanty, 2008) but that is probably an uncommon occurrence. Cattle directly compete with sage-grouse for forage seasonally (USDI USFWS, 2010) (i.e.

when hens are preparing to nest and when hens are raising broods in the summer). Livestock grazing can reduce the height and abundance of grasses and forbs in both upland and riparian habitats thus reducing both forage and cover for sage-grouse. As described by Connelly et al. (2000), sage-grouse rely on sagebrush habitats in which deep-rooted perennial grasses and forbs are a significant component. Deep-rooted perennial grasses provide hiding cover and forbs provide a large portion of sage-grouse food during the breeding, nesting and brood-rearing seasons. When these components are reduced within the community, sage-grouse survival and reproduction can be reduced. Some livestock grazing can also stimulate the growth of forbs in upland meadows and sage-grouse use light to moderately grazed meadows during the summer (Beck & Mitchell, 2000). Sage-grouse also use agricultural fields during the summer (USDI USFWS, 2010) and (Connelly, Schroeder, Sands, & Braun, 2000).

Grazing during the sage-grouse nesting season

Idaho Range readiness requires 3-4 inches of active growth if residual growth is present on deep-rooted perennial grasses (bluebunch wheatgrass and Idaho fescue) before allowing grazing in the spring. If residual growth is not present then additional growth is required before turning out cattle (Appendix J). This ensures that some herbaceous cover is present in the spring before livestock are turned out onto public lands and reduces the amount of residual herbaceous growth that is removed by livestock in the spring. Residual grass growth from the previous year is less nutritious and less used by livestock than new green growth. Holloran et al. (2005) indicate that residual cover and height of perennial grasses is important for successful sage-grouse nests.

Cattle can reduce the cover around sage-grouse nests by grazing during the nesting season. This may decrease nest success by increasing the visibility of nests to predators however no research has indicated that this is occurring. In fact, in a study area where cattle are grazed yearly, Coates and Delehanty (2010) found that nest success increased as the number of days of incubation increased in Nevada. Also in Montana on a study site where cattle are grazed, Moynahan et al. (2007) observed that nest success was higher for nests that began later in the year. Coates and Delahanty (2010) suggested that the increased nest success was due to poorly concealed nests being depredated early in incubation cycle. If livestock were removing enough cover at these sites to expose nest to predators then an opposite trend would be expected because cattle would be exposing the nests to predators by eating the existing cover. Although cattle have been identified flushing sage-grouse from nests and even one cow eating a sage-grouse egg; researchers have not indicated that flushing or nest predation by cattle is a threat to sage-grouse populations (Coates, Connelly, & Delehanty, 2008), (Coates & Delehanty, 2010)and (Moynahan, Lindberg, Rotella, & Thomas, 2007). In fact Moynahan et al. (2007) flushed sage-grouse from nests as part of their research and reported that less than one percent of sage-grouse abandoned their nests due to flushing by researchers. Coates et al. (2008) flushed hens from nests but never reported that the nests were abandoned due to flushing. Nest predation or abandonment as a result of livestock grazing can happen but appears to be a negligible cause of nest failure.

Multiple sources have indicated that livestock grazing can reduce herbaceous vegetation and degrade sage-grouse habitat (Connelly, Schroeder, Sands, & Braun, 2000), (Crawford, et al., 2004), (Beck & Mitchell, 2000), and (USDI USFWS, 2010). However multiple sources have indicated that light to moderate livestock grazing may maintain and improve herbaceous vegetation vigor and abundance compared to heavy grazing (Van Poollen & Lacey, 1979), (Holechek, Pieper, & Herbel, 1998), and (Holechek, Gomez, Molinar, & Galt, 1999).

Connelly et al. (2000) recommend that sage-grouse habitat be managed to ensure a healthy herbaceous understory that is at least seven inches in height during the spring nesting season. A grazing permit term and condition of a minimum seven inch stubble height would ensure that the height requirement is met but may not ensure that the herbaceous layer is healthy and robust. Grazing deep-rooted perennial grasses

to a seven inch height every year during the growing season would remove all the seedheads and would effectively limit reproduction. Deferment or rest, on the other hand would ensure both the adequate height in that year and the healthy herbaceous understory in subsequent years. Holloran et al. (2005) suggest that at least 4 inches of residual grass height is important for successful sage-grouse nests.

Livestock graze in an uneven manner and each pasture will have areas of higher and lower utilization usually affected by distance from water and slope. Even in years with heavy utilization in some areas, some areas may be lightly or un-grazed. Sage-grouse select areas that have higher grass and sagebrush cover than random sites (Connelly, Schroeder, Sands, & Braun, 2000). Some areas may not be capable of producing grass that is seven inches tall. Therefore sage-grouse would seek out areas with suitable cover which may take more effort in years when grazing occurs during the nesting season. Basically, sage-grouse will find suitable nest sites within many different sagebrush habitats if the vegetative components of these habitats are able to maintain their vigor and reproductive capability.

Seven inches is not a threshold where suddenly sage-grouse nesting success disappears. Multiple studies have found successful sage-grouse nests in areas that averaged less than seven inches of herbaceous cover (Connelly, Schroeder, Sands, & Braun, 2000). Even a stubble height term and condition cannot guarantee that every herbaceous plant will have a seven inch stubble height. Additionally areas with taller sagebrush may require grass heights much taller than 7 inches in order to provide adequate cover (Connelly, Schroeder, Sands, & Braun, 2000). Therefore the focus is to develop a healthy and vigorous herbaceous understory capable of reproducing and maintaining itself on the landscape. The goal is to improve vigor, allow for reproduction and establishment, and ensure properly functioning ecosystems and then let sage-grouse select suitable nesting habitats within those ecosystems. Grazing management that provides for increased vigor and reproductive capability would also increase cover and forage for sage-grouse and would increase suitable nesting sites and increase nest and brood success.

Holloran et al. (2005) suggest that degrading nesting habitat reduces nesting success. It follows that improving nesting habitat would increase nesting success. Management that increases residual grass cover and height in sagebrush stands would increase sage-grouse nesting success (Holloran, et al., 2005). Barnett and Crawford, (1994) found that sage-grouse hens selected a high proportion of forbs in their early spring diet and in years when forbs were available sage-grouse production was higher. This suggests that increasing the amounts of forbs available would improve sage-grouse hen nutritional status and nesting success.

West Nile Virus has been documented as a source of mortality for sage-grouse in Idaho and in 2006, sage-grouse hunting was closed in western Owyhee count due to concerns of West Virus impacts (Idaho Sage-grouse Advisory Committee, 2008). Sage-grouse are quite susceptible to West Nile Virus and very few are resistant to the disease. West Nile Virus is primarily spread by mosquitoes which breed in a variety of locations including springs, creeks, reservoirs, stock ponds and troughs. Many water sources are present within the Garat allotment that could support mosquitoes infected with West Nile Virus. West Nile Virus is expected to remain in the area and sage-grouse would continue to be at risk of exposure but no alternatives within this EA are expected to add to or subtract from that risk of exposure.

Other Factors affecting wildlife habitat in uplands

Cheatgrass effects to shrub steppe habitat

Non-native invasive species alter environmental conditions and/or resource availability, causing functional as well as compositional changes (D'Antonio & Vitousek, 1992). Invasive species often out-compete native vegetation for water and nutrients, which results in less-vigorous native species and fewer seedlings that survive. Over time, invasive species may eliminate some native plant species from the community. Invasive species like cheatgrass are more fire-adapted than native species in the shrub steppe

ecosystems and quickly establish after a fire. Invasion can set in motion a grass/fire cycle where an invasive grass colonizes an area and provides the fine fuel necessary for the initiation and propagation of increasingly frequent and intense fire occurrences. As fire frequencies increase, cheatgrass can become the dominant species in the community and alter the habitat sufficiently that it is no longer used by many species of wildlife. Cheatgrass out-competes native grass and forb species that wildlife rely on for cover and forage but provides less cover and lower-quality forage. Once cheatgrass becomes a dominant part of a plant community, is very difficult to remove, and cost-effective techniques for large areas have not been developed. Areas in which cheatgrass is a dominant component would be expected to remain in that state regardless of what type of grazing practices are implemented under Alternatives 1-5.

Climate Change

Climate change can affect the suitability and potential of habitats upon which wildlife rely. Wildlife species and the plant communities upon which they rely must either adapt to environmental changes or move to locations with suitable environmental conditions for survival and reproduction. For wildlife to effectively adapt, habitats need to be in good condition and provide opportunities for reproduction and survival. Large intact landscapes are necessary to allow for habitat movement in response to climate change up and down in elevation and north and south. Intact and connected habitats would allow sagebrush to colonize higher elevations and more northern locations as temperatures increase and as lower elevations and more southern locations become unsuitable for the maintenance of sagebrush. As habitats become fragmented or have low vigor and are not able to reproduce they become less able to adapt to changing climate conditions and portions of habitats may be lost. Additional discussion of climate change can be found in Sections 2.6.9, 3.3.1, and 3.4.1.1 of this EA.

3.7.2.1 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 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 3.3.2.1). 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 less desirable 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. Little riparian habitat occurs in the Garat allotment (Section 3.6.2). 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. Additionally ORMP wildlife and special status species objectives are not expected to be met by implementation of alternative 1.

Focal Special Status Animal Species

Greater sage-grouse

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 within 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, 2014b). Average perennial herbaceous vegetation heights of fewer than 7 inches only provide marginal nesting cover could result from grazing under Alternative 1 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 where pastures were rested, which would provide improved 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, 2014b). 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 provide taller average perennial herbaceous vegetation heights and improved nesting habitat conditions.

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, 2014b). 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-2). 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 3.3.1), 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, public comment has suggested that BLM abide by the recommendations of 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's

approach currently emphasizes perennial herbaceous vegetation height as a more accurate, consistent, and repeatable measure of determining adequate cover than subjective percent utilization levels. Regardless, under Alternative 1, BLM would implement the ORMP's 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 buildup 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.

3.7.2.2 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 3.3.2.2). 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 riparian areas (Piute Creek) in pasture 4 would be grazed during the hot season. Additionally the proposed grazing plan and the proposed grazing permit would allow flexibility to use pastures outside of the proposed schedule without approval from the BLM (Appendix E). This would allow every pasture to be grazed in both the growing season and the hot season for riparian every year. These factors 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 deferment or 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. 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. The proposed seasons of use are very similar to the current situation except spring pastures would be grazed 15 days longer under alternative 2. The similar seasons of use coupled with the increase in active AUMs would not allow the

allotment to make progress towards meeting Standard 8. Additionally ORMP wildlife and special status species objectives are not expected to be met by implementation of 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 an approximately 21 percent increase in AUMs would be authorized, and growing-season use would continue in upland and hot-season use in riparian areas. 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 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 deferred or 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 occasional deferment or infrequent 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 include 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.”

Pygmy Rabbit
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 and higher AUMs 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).

3.7.2.3 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 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. In addition to the terms and conditions discussed in Sections 3.3.2 and 3.6.3 (#13 and #14, respectively) which would benefit upland and riparian breeding, nesting, and foraging habitats for special status 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. Additionally ORMP wildlife and special status species objectives are expected to be met by implementation of Alternative 3.

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 improve. 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.

3.7.2.4 Alternative 4 Effects

Effects Common to all Sub-alternatives of Alternative 4
All sub-alternatives of Alternative 4 would be expected to allow the allotment to make progress toward meeting Standard 8. Additionally ORMP wildlife or special status species objectives are expected to be met by implementation of Alternatives 4A or 4B. However, 4C would not allow the allotment to meet the ORMP objectives for wildlife and special status species within the proposed 0.3-mile water gap, but would meet the objectives for the remainder of the allotment.

Pastures 1 and 2 (Dry Lake and Piute Creek)
Under all sub-alternatives of Alternative 4, these pastures would be grazed in the early spring of each year prior to the initiation of growth on deep-rooted perennial grasses. One of 3 years, livestock would be allowed to remain in these pastures until June 30. This would allow livestock to graze these pastures during the sage-grouse breeding season in 1 of 3 years. Livestock would not be allowed to graze riparian habitats during the summer hot season in any year.

Sage-grouse
Alternative 4 would reduce the duration of grazing within pastures 1 and 2 and would reduce the AUMs compared to the current situation. The vigor and potential for recruitment of deep-rooted perennial grasses would increase, resulting in more and larger grass plants that would increase the amount of concealment cover. Reduced grazing intensity and duration is also expected to increase height of perennial grasses during the nesting season which would increase concealment cover for sage-grouse nests and would result in increased nest success. Livestock grazing around sage-grouse nests can also reduce the height of perennial grasses and reduce the concealing cover that sage-grouse rely on to avoid predators like ravens and badgers. The reduced AUMs and the deferment 2 of 3 years would reduce the likelihood of livestock exposing sage-grouse nests to predators.

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.

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 46 percent reduction in AUMs in these pastures in comparison to Alternative 1, perennial herbaceous vegetation height 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 46 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.

The late-brood-rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance since grazing pressure would be reduced and no grazing would occur

during the summer hot season. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall. Under this alternative, sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase.

Pygmy Rabbit
Pygmy rabbits rely on sagebrush for concealment cover and forage in all seasons. In the spring, summer, and fall their diet shifts to grasses and forbs, but sagebrush remains a significant portion of their diet (Green & Flinders, 1980). Pygmy Rabbits typically inhabit areas of tall dense sagebrush with friable soils. Under Alternative 4, sagebrush cover would be maintained and grazing pressure on forbs and grasses would be reduced. Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not known to occur on the Garat allotment, cover and forage would be maintained and increased within pastures 1 and 2.

Migratory and other Special Status Birds
Under Alternative 4, reduced grazing pressure and adjusted seasons of use that provide for growing-season deferment 2 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing in 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced and livestock grazing would not occur during the hot summer season when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. Bird species that rely on the wet meadows and occasional willows within Piute Creek would have increased vigor, diversity, and abundance of riparian plant species, which would provide increased forage and cover due to reduced grazing pressure and an altered season of use.

Effects to most raptors would be minimal, as the territories of most species extend beyond the allotment boundaries. Under all sub-alternatives of Alternative 4, habitat improvement for raptor prey species, including raptors, would be similar to those discussed previously for Alternative 3.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use, coupled with growing season deferment in 2 of 3 years, would result in increased forage and cover for wildlife species. Additionally no grazing during the summer hot season would allow increases in the abundance and diversity of riparian habitat in Piute Creek, which would increase the amount and types of habitats provided for riparian-dependent wildlife species. Livestock would continue to compete with big game for forage in the spring each year, but there would be fewer cattle and a shorter season of use than under the current situation, and thus competition would also be reduced.

Pasture 5 and 6 (Big Horse and Juniper Basin)

Under all sub-alternatives of Alternative 4, these pastures would be grazed after the end of the upland vegetation growing season each year, and in 1 of 3 years, livestock would be allowed to graze from the early spring through the growing season, as well. This would allow livestock to graze these pastures during the sage-grouse breeding season in 1 of 3 years.

Sage-grouse

Impacts to sage-grouse would be expected to be essentially the same as those described for pastures 1 and 2 under Alternative 4 above, except there is no riparian habitat within these pastures.

Pygmy Rabbit
Impacts to pygmy rabbit would be expected to be essentially the same as those described for pastures 1 and 2 under Alternative 4 above.

Migratory and other Special Status Birds
Impacts to special status bird species would be expected to be essentially the same as those described for pastures 1 and 2 under Alternative 4 above, except there is no riparian habitat within these pastures.

Big Game and other Special Status Mammals
Impacts to big game and special status mammals would be expected to be essentially the same as those described for pastures 1 and 2 under Alternative 4 above, except there is no riparian habitat within these pastures.

Pastures 7 and 8 (Piute Camp Enclosure and Piute Creek Enclosure)

Under all sub-alternatives of Alternative 4, these pastures would be excluded from livestock grazing. Together, pastures 7 and 8 consist of 124 acres and are completely on BLM land. Impacts to special status species that use the upland and riparian habitats within these pastures would be essentially the same as described under the no-grazing alternative; however, the scale of the impacts would be greatly reduced because of the small size of area that would be removed from grazing. This stretch of Piute Creek would progress towards PFC, as no impacts from livestock grazing would occur; erosion would decrease and vegetative diversity and vigor would increase.

Pastures 9, 10, and 11 (Four Corners West, Four Corners East, and Stateline)

Under all sub-alternatives of Alternative 4, these pastures would be used for holding horses and short-term holding of livestock. The season of use would be extended by 15 days (from 9/30 in the current authorization to 10/15) and permitted AUMs for horses increase from 99 to 106. No monitoring data is available for these small holding pastures within the Garat allotment, as they constitute only a minor proportion of the allotment (less than 0.1 percent). Conditions within these pastures are expected to remain similar to current conditions and would have negligible effects to the populations of special status species within the Garat allotment.

Effects Specific to Each Sub-alternative of Alternative 4

Alternative 4A

Pasture 3 (Forty-Five)
This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season in 1 of 3 years and would be grazed during the riparian summer hot season and into the fall in 1 in 3 years. This pasture would also be rested in 1 of 3 years. AUMs would be reduced and this pasture would receive less grazing pressure and more frequent rest under this alternative compared to the current situation.

Sage-grouse
The vigor and potential for recruitment of deep-rooted perennial grasses would increase, resulting in more and larger grass plants that would increase the amount of concealment cover. Reduced grazing intensity

and duration is also expected to increase height of perennial grasses during the nesting season which would increase concealment cover for sage-grouse nests and would result in increased nest success. Livestock grazing around sage-grouse nests can also reduce the height of perennial grasses and reduce the concealing cover that sage-grouse rely on to avoid predators like ravens and badgers. The reduced AUMs and the deferment 1 of 3 years coupled with additional rest 1 of 3 years would reduce the likelihood of livestock exposing sage-grouse nests to predators.

The late brood rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance since grazing pressure would be reduced and grazing would occur during the summer hot season only 1 of 3 years. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall in 2 of 3 years. Under this alternative sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase. One year in three sage-grouse and livestock would compete for succulent vegetation along Piute Creek and available forage for sage-grouse could be reduced.

Pygmy Rabbit
Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not known to occur on the Garat allotment, cover and forage would be maintained and increased within pasture 3.

Migratory and other Special Status Birds
Under Alternative 4, reduced grazing pressure and adjusted seasons of use that provide for growing season deferment 1 of 3 years coupled with additional rest 1 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced and livestock grazing would not occur during the hot summer season 2 of 3 years when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. Bird species that rely on the wet meadows and occasional willows within Piute Creek would have increased vigor, diversity, and abundance of riparian plant species which would provide increased forage and cover because of the reduced grazing pressure and altered season of use.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use coupled with growing season deferment 1 of 3 years coupled with additional rest 1 of 3 years would result in increased forage and cover for wildlife species. Additionally, no grazing during the summer hot season in 2 of 3 years would allow increases in the abundance and diversity of riparian habitat in Piute Creek, which would increase the amount and types of habitats provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Pasture 4 (Kimball)

This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season 1 of 3 years and would be grazed during the riparian summer hot season and into the fall 1 in 3 years. This pasture would also be rested 1 of 3 years.

Sage-grouse
The vigor and potential for recruitment of deep-rooted perennial grasses would increase, resulting in more and larger grass plants that would increase the amount of concealment cover. Reduced grazing intensity and duration is also expected to increase height of perennial grasses during the nesting season which would increase concealment cover for sage-grouse nests and would result in greater nest success. Livestock grazing around sage-grouse nests can also reduce the height of perennial grasses and reduce the concealing cover that sage-grouse rely on to avoid predators like ravens and badgers. The reduced AUMs and the deferment 1 of 3 years coupled with additional rest 1 of 3 years would reduce the likelihood of livestock exposing sage-grouse nests to predators.

The late-brood-rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance, since grazing pressure would be reduced and grazing would occur during the summer hot season only 1 of 3 years. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall in 2 of 3 years. Under this alternative, sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase. One year in 3, sage-grouse and livestock would compete for succulent vegetation along Piute Creek and available forage for sage-grouse could be reduced.

Pygmy Rabbit
Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not known to occur on the Garat allotment, cover and forage would be maintained and increased within pasture 3.

Migratory and other Special Status Birds
Under Alternative 4A, reduced grazing pressure and adjusted seasons of use that provide for growing-season deferment 2 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush-dependent bird species. Livestock grazing 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population-level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced and livestock grazing would not occur during the hot summer season 2 of 3 years when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. The wet meadows and occasional willows within Piute Creek, upon which riparian-dependent bird species rely, would have increased vigor, diversity, and abundance of riparian plant species, which would provide increased forage and cover because of the reduced grazing pressure and altered season of use.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use, coupled with growing season deferment 1 of 3 years and additional rest 1 of 3 years, would result in increased forage and cover for wildlife species. Additionally no grazing during the summer hot season in 2 of 3 years would allow increases in the abundance and diversity of riparian habitat in Piute Creek which would increase the amount and types of habitats

provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Alternative 4B

Pasture 3 (Forty-Five)

This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season in 1 of 3 years. It would also be grazed during the summer and fall each year. A term and condition of the permit would require the use of livestock management practices (e.g., herding, salt and supplement placement, and livestock movement) to control the timing and location of grazing use consistent with the riparian constraints.

Sage-grouse
Vegetative cover and forage for sage-grouse during the breeding season would increase in vigor and abundance as grazing pressure is reduced and the season of use is moved out of the vegetation growing season 2 of 3 years. Livestock would be able to use the upland in this pasture each year after the growing season and would remove some of the residual grass that sage-grouse rely on in the spring when selecting nests. However with the conservative stocking rate, residual grass heights on deep-rooted perennial grasses are expected to be adequate (more than 4 inches) to conceal sage-grouse nests.

The late brood rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance since grazing pressure would be reduced and grazing would occur during the summer hot season only 1 of 3 years because the permittee would be required to actively keep livestock out of Piute Creek through multiple livestock management techniques. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall in 2 of 3 years. Under this alternative sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase. One year in 3, sage-grouse and livestock would compete for succulent vegetation along Piute Creek and available forage for sage-grouse could be reduced.

Pygmy Rabbit
Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not known to occur on the Garat allotment, cover and forage would be maintained and increased within pasture 3.

Migratory and other Special Status Birds
Under Alternative 4B, reduced grazing pressure and adjusted seasons of use that provide for growing season deferment in 2 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover, which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing in 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced because livestock grazing would not occur during the hot summer season 2 of 3 years when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. Bird species that rely on the wet meadows and occasional willows within Piute Creek

would have increased vigor, diversity, and abundance of riparian plant species which would provide increased forage and cover because of the reduced grazing pressure and altered season of use.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use coupled, with growing season deferment 1 of 3 years and additional rest 1 of 3 years, would result in increased forage and cover for wildlife species. Additionally no grazing during the summer hot season 2 of 3 years would allow increases in the abundance and diversity of riparian habitat in Piute Creek which would increase the amount and types of habitats provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Pasture 4 (Kimball)
This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season in 1 of 3 years. It would also be grazed during the summer and fall each year. A term and condition of the permit would require the use of livestock management practices (e.g. herding, salt and supplement placement, and livestock movement) to control the timing and location of grazing use consistent with the riparian constraints.

Sage-grouse
Vegetative cover and forage for sage-grouse during the breeding season would increase in vigor and abundance, as grazing pressure is reduced and the season of use is moved out of the vegetation growing season 2 of 3 years. Livestock would be able to use the upland in this pasture each year after the growing season and would remove some of the residual grass that sage-grouse rely on in the spring when selecting nests. However with the conservative stocking rate, residual grass heights on deep-rooted perennial grasses are expected to be adequate (more than 4 inches) to conceal sage-grouse nests.

The late-brood-rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance, since grazing pressure would be reduced and grazing would occur during the summer hot season only 1 of 3 years. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall in 2 of 3 years. Under this alternative, sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase. One year in three sage-grouse and livestock would compete for succulent vegetation along Piute Creek and available forage for sage-grouse could be reduced.

Pygmy Rabbit
Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not known to occur on the Garat allotment, cover and forage would be maintained and increased within pasture 3.

Migratory and other Special Status Birds
Under Alternative 4, reduced grazing pressure and adjusted seasons of use that provide for growing season deferment 1 of 3 years, coupled with additional rest 1 of 3 years, would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts

are expected to be rare and not have population level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced and livestock grazing would not occur during the hot summer season 2 of 3 years when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. The wet meadows and occasional willows within Piute Creek, upon which riparian dependent bird species rely, would have increased vigor, diversity, and abundance of riparian plant species which would provide increased forage and cover because of the reduced grazing pressure and altered season of use.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use, coupled with growing season deferment 2 of 3 years, would result in increased forage and cover for wildlife species as compared to the current situation. Additionally, no grazing during the summer hot season 2 of 3 years would allow increases in the abundance and diversity of riparian habitat in Piute Creek which would increase the amount and types of habitats provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Alternative 4C

Pasture 3 (Forty-Five)

This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season in 1 of 3 years and would be grazed during the riparian summer hot season and into the fall in 1 in 3 years. This pasture would also be rested in 1 of 3 years. AUMs would be reduced and this pasture would receive less grazing pressure and more frequent rest under this alternative compared to the current situation.

Sage-grouse
The vigor and potential for recruitment of deep-rooted perennial grasses would increase, resulting in more and larger grass plants that would increase the amount of concealment cover. Reduced grazing intensity and duration is also expected to increase height of perennial grasses during the nesting season which would increase concealment cover for sage-grouse nests and would result in increased nest success. Livestock grazing around sage-grouse nests can also reduce the height of perennial grasses and reduce the concealing cover that sage-grouse rely on to avoid predators like ravens and badgers. The reduced AUMs and the deferment 1 of 3 years coupled with additional rest 1 of 3 years would reduce the likelihood of livestock exposing sage-grouse nests to predators.

The late brood rearing habitat in the form of the riparian habitat along Piute Creek would increase in vigor, diversity, and abundance since grazing pressure would be reduced and grazing would occur during the summer hot season only 1 of 3 years. Sage-grouse would be able to use this habitat without any competition from livestock in the summer and early fall in 2 of 3 years. Under this alternative sage-grouse use of Piute Creek would be expected to increase as the diversity and abundance of riparian plant species increase. One year in three sage-grouse and livestock would compete for succulent vegetation along Piute Creek and available forage for sage-grouse could be reduced.

Pygmy Rabbit
Vigor and abundance of grasses and forbs would be expected to increase as AUMs are reduced and livestock are not grazing during the growing season in 2 of 3 years. Although pygmy rabbits are not

known to occur on the Garat allotment, cover and forage would be maintained and increased within pasture 3.

Migratory and other Special Status Birds
Under Alternative 4, reduced grazing pressure and adjusted seasons of use that provide for growing season deferment 1 of 3 years coupled with additional rest 1 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population level impacts to special status bird species. Grazing pressure on the riparian habitat within Piute Creek would be reduced and livestock grazing would not occur during the hot summer season 2 of 3 years when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. Bird species that rely on the wet meadows and occasional willows within Piute Creek would have increased vigor, diversity, and abundance of riparian plant species which would provide increased forage and cover because of the reduced grazing pressure and altered season of use.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use coupled with growing season deferment 1 of 3 years coupled with additional rest 1 of 3 years would result in increased forage and cover for wildlife species. Additionally, no grazing during the summer hot season in 2 of 3 years would allow increases in the abundance and diversity of riparian habitat in Piute Creek, which would increase the amount and types of habitats provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Pasture 4 (Kimball)
This pasture would be grazed during the upland vegetation growing season and the sage-grouse breeding season 1 of 3 years. It would also be grazed during the summer and fall in all years. The 0.3-mile of Piute Creek within pasture 4 would be managed as a water gap to water livestock. Neither seasonal riparian constraints nor the ORMP objectives for riparian, wildlife, and special status species would be applied. Livestock congregating within the riparian habitat would result in trampling and removal of hydric vegetation that would create a nick point where the periodic runoff events could erode the soils and remove additional hydric vegetation downstream of the water gap. This could limit the potential improvement of Piute Creek just below the water gap and would limit the forage and cover available to riparian dependent wildlife species.

Sage-grouse
Vegetative cover and forage for sage-grouse during the breeding season would increase in vigor and abundance as grazing pressure is reduced and the season of use is moved out of the vegetation growing season 2 of 3 years. Livestock would be able to use the upland in this pasture each year after the growing season and would remove some of the residual grass that sage-grouse rely on in the spring when selecting nests. However with the conservative stocking rate, residual grass heights on deep-rooted perennial grasses are expected to be adequate (greater than or equal to 4 inches) to conceal sage-grouse nests.

Late-brood-rearing habitat in the form of the 0.3 miles of Piute Creek within this pasture would be grazed each year during the hot summer season and the diversity and abundance of riparian habitat within this reach would not increase and would likely decrease further. Sage-grouse use of this area for late-brood-rearing habitat would decrease and sage-grouse would travel elsewhere to find succulent vegetation in the summer.

Migratory and other Special Status Birds
Under Alternative 4, reduced grazing pressure and adjusted seasons of use that provide for growing season deferment 2 of 3 years would improve the vigor and abundance of forbs and deep-rooted perennial grasses that are used as cover and forage for many bird species. Insects would also have additional forage and cover, which would increase insect populations and increase the forage base for insectivorous bird species. Sagebrush cover would be maintained for sagebrush dependent bird species. Livestock grazing in 1 of 3 years during the upland growing season and most migratory birds' breeding season could result in some trampled nests or failed nests from livestock stepping on nests, flushing birds from nests or removing concealment cover around nests. These impacts are expected to be rare and not have population level impacts to special status bird species. Grazing on the riparian habitat within Piute Creek would occur during the hot summer season each year when riparian areas are typically most impacted by livestock loafing in the cooler wet riparian habitats. The diversity and abundance of riparian habitat within this reach would not increase and would likely decrease. Foraging, nesting and hiding habitats within this riparian area would remain limited as a result.

Big Game and other Special Status Mammals
Reduced AUMs and a shorter season of use, coupled with growing season deferment 1 of 3 years and additional rest 1 of 3 years would result in increased forage and cover for wildlife species. Additionally, grazing during the summer hot season each year would decrease the abundance and diversity of riparian habitat in Piute Creek which would decrease the amount and types of habitats provided for riparian dependent wildlife species. Livestock would continue to compete with big game for forage when this pasture is grazed but there would be fewer cattle and a shorter season of use than under the current situation and thus competition would also be reduced.

Under Alternative 4C, 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.

Implementation of Alternative 4C, 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."

Under all sub-alternatives of Alternative 4, upland and riparian habitats would make progress towards meeting Standard 8. Under Alternative 4C, the 0.3 miles of Piute Creek within pasture 4 would be considered a water gap for watering livestock and would not make progress towards meeting Standard 8, but the remainder of riparian habitat along Piute Creek within the Garat allotment would make progress toward meeting Standard 8. The portion of Piute Creek just below the water gap would make progress at a slower rate due to occasional erosional effects from runoff events and the nick point created by the water gap.

3.7.2.5 **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 and special status species 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.

3.7.3 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-2 and Map WDLF-3 inset) (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	1,206,527 acres (1985-2013)	Unknown
Vegetation Treatments (Prescribed Fire and Mechanical)[74]	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	16-25 mile (Gateway West Project)

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.

Between 2012 and 2014, more than 68 allotments within the Owyhee Field Office have had Final Decisions issued that implemented changes to livestock management practices, including altered seasons of use, deferment, rest, and reductions in AUMs, which are intended to result in significant progress toward meeting the Idaho Standards for Rangeland Health. This is expected to result in improvement of wildlife habitats in both upland and riparian areas, which would allow for more robust wildlife populations.

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

[74] The Boise Owyhee Sage-grouse habitat restoration project (BOSH) is in the early scoping phases and does not have a well-developed set of alternatives. Therefore it is too early to attempt to analyze how the potential effects of that project may or may not add to the effects of this current permit renewal process.

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., West Nile Virus (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 Population Management Unit (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).

3.7.3.1 Alternatives 1 and 2 Cumulative 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. 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. These effects would negligibly contribute to an overall decrease in the quality of wildlife habitat across the cumulative effects area.

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.

3.7.3.2 Alternatives 3 and 4 Cumulative 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 season-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 across the CIAA.

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 majority of wildlife populations including the Owyhee sage-grouse subpopulation most likely would not be measurably affected due to the small size of the allotment in relation to the cumulative effects area.

Under sub-alternative 4C in pasture 4, the 0.3 miles of Piute Creek that would be used as a water gap would not make progress toward providing suitable late-brood-rearing habitat for sage-grouse or provide suitable cover and forage for riparian dependent species. However 0.3 miles is a very small section of riparian habitat when considered in the context of the Cumulative Effects Analysis Area and the loss of this short segment of riparian habitat would not affect sage-grouse and other special status species populations within the analysis area.

3.7.3.3 Alternative 5 Cumulative 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.

3.8 Recreation

3.8.1 Affected Environment

The majority of the Garat allotment is located within the Owyhee Extensive Recreation Management Area (ERMA). 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 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 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 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).

3.8.2 Direct and Indirect Effects

3.8.2.1 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.

3.8.2.2 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.

3.8.2.3 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.

3.8.2.4 Alternative 4 Effects

The proposed season-based alternative, in combination with fewer AUMs and reduced livestock numbers under all sub-alternatives, would reduce interactions between livestock and recreationists overall. However, this alternative's flexibility to extend the season of use within most pastures 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.

3.8.2.5 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.

3.8.3 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 Omnibus Public Lands Management Act (OPLMA) that was passed by congress on March 30, 2009 (P.L. 111-11). 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).

3.8.3.1 Alternatives 1- 5 Cumulative 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.

3.9 Visual Resources

3.9.1 Affected Environment

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).

The majority of the Garat 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 Interim Management Policy 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.

3.9.2 Direct and Indirect Effects

3.9.2.1 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.

3.9.2.2 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. 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 and springs 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.

3.9.2.3 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

3.9.2.4 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 under all sub-alternatives 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.

3.9.2.5 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.

3.9.3 Cumulative Effects

Cumulative effects area would be the same as that described in Section 3.8.3.

3.9.3.1 Alternatives 1, 3, 4, 5 Cumulative 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.

3.9.3.2 Alternative 2 Cumulative Effects

The impacts associated with this alternative in combination with past, present, and future 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.

3.10 Areas of Critical Environmental Concern and Research Natural Areas

3.10.1 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 ACEC.

Owyhee River Bighorn Sheep Habitat Area ACEC (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).

3.10.2 Direct and Indirect Effects

3.10.2.1 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 ACEC 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.

3.10.2.2 Alternative 5 Effects

The no-grazing alternative would not include activities excluded or prohibited within Owyhee River Bighorn Sheep Habitat Area ACEC. Similarly, the alternative would eliminate the need for compliance inspections related to restrictions to livestock grazing and salting within the portions of the 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.

3.10.3 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.

3.10.3.1 Alternative 1-5 Cumulative 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.

3.11 Wilderness and Wild and Scenic Rivers

3.11.1 Affected Environment

Approximately 49,653 acres of the Garat allotment are located within the 267,000 acre Owyhee River Wilderness, which was designated in 2009 by the Omnibus Public Land Management Act (OPLMA). The OPLMA authorized continued livestock grazing in the wilderness areas where it had previously occurred, and at the approximate levels that had existed prior to their designation. The OPLMA

specifically stated that the wilderness areas would be managed pursuant to the Wilderness Act of 1964, and subject to the requirements of the Congressional Grazing Guidelines (Appendix A of House Report 101-405).

The East Fork and South Fork Owyhee Rivers were two of 16 river segments designated as wild and scenic rivers in the OPLMA. The canyon rims along the East Fork and South Fork Owyhee Rivers make up the northern and western borders of the allotment, and as such, livestock grazing is not authorized within the river canyons. Livestock access to the river corridors is restricted by natural barriers and fencing.

3.11.2 Direct and Indirect Effects

3.11.2.1 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.

3.11.2.2 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.

3.11.2.3 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.

3.11.2.4 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 under all sub-alternatives. 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.

3.11.2.5 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.

3.11.3 Cumulative Effects

The cumulative effects area would be the same as that identified in Section 3.8.3.

3.11.3.1 Alternatives 1, 3, 4, 5 Cumulative Effects

Cumulative effects to these alternatives would be the same as those discussed in Section 3.5.6.3.1.

3.11.3.2 Alternative 2 Cumulative 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 and with increased livestock numbers and AUMs available for active use, 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.

3.12 Lands with Wilderness Characteristics (Outside of Designated Wilderness)

3.12.1 Affected Environment

There were no units outside of designated wilderness within the Garat allotment found to contain Lands with Wilderness Characteristics.

3.13 Economic and Social Values

3.13.1 Affected Environment

This socioeconomic analysis will focus primarily on Owyhee County, Idaho, where all of the Garat allotment is located, but as the livestock operator who own the cattle maintains a base ranch in Tuscarora, Nevada (Elko County) and the economy of Owyhee County is closely tied to the adjacent community of Jordan Valley, Oregon, (Malheur 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, and mining	19.4%	12.4%	22.8%	1.9%
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	2.9%	4.2%	5.1%	10.4%

Industry	Owyhee County, Idaho	Malheur County, Oregon	Elko County, Nevada	United States
services				
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

Farm Type	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
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

Farm Type	Owyhee County, ID	Elko County, NV	Malheur County, OR	County Region	U.S.
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%

	Owyhee Co. (ID)	Malheur Co. (OR)	Elko Co. (NV)
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[75] 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 Garat allotment 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 Tuscarora, Nevada or other private land. Table SOCE-5 shows the number of acres in the Garat allotment and in the total Owyhee Resource Area.

Table SOCE-5: Federal, state, and private acreage in the Garat allotment and Owyhee Field Office

	Federal	State	Private	Total
Garat Allotment^	202,618 acres	8,836 acres	207 acres	211,661 acres
Owyhee Field Office*	1,298,728 acres	118,774 acres	187,651 acres	1,605,155 acres

^Source: 2012 Rangeland Health Assessment/Evaluation Reports for each allotment
*Source: Owyhee Resource Management Plan

[75] 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).

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. Table SOCE-6 shows 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[76].

Table SOCE-6: 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, 2012)

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

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

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 SOCE-10 below). People may spend less time and money on recreational activities in areas where the natural resources have become degraded. The Group 1 allotments, including the Garat allotment 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, which is 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 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, including the Garat allotment. 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.

Rangeland Ecosystem Goods and Services

Healthy rangeland ecosystems can provide multiple goods and services that can increase the economic, social, and cultural well-being of individuals and communities. To the degree that rangeland resources are degraded, an opportunity exists, through restoration of ecosystem health, to obtain these goods and services at a higher and more productive level.

According to participants in the Sustainable Rangelands Roundtable (Roundtable), rangeland ecosystem goods and services are divided into three main categories: Biological, hydrological/atmospheric, and miscellaneous.[77] The Roundtable identified a list of goods and services available from healthy rangelands, some of which are shown. Additional goods and services not identified by the Roundtable have been added to their list (see Table SOCE-7) to show other potential gains within the Owyhee region. This list should not be considered as exhaustive. There may be even more potential goods and services that could be provided in greater amounts by an increase in rangeland health in the area.

Table SOCE-7: Rangeland ecosystems services

Biological	Hydrological/Atmospheric	Miscellaneous
Domestic Livestock Production	Clean Drinking Water	Scenic Views

[77] Source: http://sustainablerangelands.org/pdf/Ecosystem_Goods_Services.pdf.

Biological	Hydrological/Atmospheric	Miscellaneous
Other Food for Human Consumption	Water for Downstream Economic Uses	Cultural or Spiritual Resources
Forage for Livestock	Floods for Channel and Riparian Area Rejuvenation	Historical/Archeological Sites
Fiber	Flood Mitigation	Recreation and Tourism Sites
Biofuels	Water Bodies for Recreation/Tourism	
Wildlife Habitat Benefits (Fishing, Hunting, Viewing, Existence Value, etc.)	Minimization of Soil Erosion and Downwind/Downstream Soil Deposition	
Potential Biochemicals	Contribution to Clean, Fresh Air	
Genetic Material	Carbon Sequestration	

Some of the potential benefits of increased rangeland health would be realized by individuals who live far away from the Owyhee region. Because streams flowing through the area eventually contribute to the Snake and Columbia River systems, any extra sediment that leaves the area could result in lower hydrologic capacity, lower resistance to flooding, and decreased capacity for boat traffic on the Snake and Columbia rivers. In addition, stream-bottom sediment deposition decreases success rates for spawning fish species, possibly contributing to extended protection and expensive habitat-loss mitigation for salmon and other fish species. While these benefits might not be directly enjoyed by members of the Owyhee community, their value to society as a whole needs to be accounted for. An example of a "downwind" good or service is enhanced carbon sequestration potential, the benefits of which accrue to the entire global community and all earth ecosystems. Although these benefits are not focused on the Owyhee region, their value to the world as a whole must be weighed in the process of evaluating the relative benefits and costs of changes in range allotment permits and management decisions.

In 2011, researchers at the University of Nevada, Reno (UNR) prepared a preliminary draft of a flow-model for economic analysis for land management decision-making in the Intermountain West[78]. In conjunction with this project, the researchers assembled an annotated bibliography of existing studies on the value of ecosystem services provided by rangeland and other land types in the western United States. Table SOCE-8 shows a list of the ecosystem goods services included in that bibliography. For each ecosystem good or service in the list, the table discloses:

a. Whether an impact is expected to occur under any of the alternatives under consideration within this planning process;

[78] *Economic Flow-Model for Western Rangelands: Annotated Bibliography and Additional Resources*, June 2011, University of Nevada, Reno, is available from the Owyhee Field Office project record upon request.

b. Whether any anticipated impacts are expected to be measureable;
c. Whether the research included in the bibliography has been able to assign a monetary value to impacts to the ecosystem good or service in question; and
d. Additional resources or data sources used in evaluating the good or service for this EA.

The UNR document also outlines the conditions under which it would be reasonable to use the studies it cites to estimate the monetary value of the goods and services listed.

Table SOCE-8: Rangeland ecosystem goods and services and whether there are potential impacts from grazing and potential values of the services

	Ecosystem Goods and Services listed in the University of Nevada, Reno's Annotated Bibliography	Is this resource expected to be affected under one or more of the alternatives being considered?	Is it expected to be affected in a manner and/or to a degree that can be measured?	Has research found a way to assign a monetary value to impacts to this resource?	Additional source(s) of documentation on this resource and its value and/or additional information
A.1	Ranch Incomes	Yes	Yes	Yes	BLM Value of Change in AUMs Calculator
A.2	Amenity Value of Ranching Lifestyle	Yes	No	Yes	
A.3	Recreation	No	No	Yes	
A.4	Wildfires	Maybe	?	Yes	
A.5	Erosion and Hydrology	Maybe	No	Yes	FS WEPP and WEPS water and wind erosions models
A.6	Carbon Sequestration	Yes	No	Yes	The Chicago Climate Exchange carbon markets is not currently functional. If and when it becomes functional again, the market value of carbon will serve as a type of measure of the economic value of carbon sequestration. It is important to note that the true value of carbon sequestration is found in reduced future impacts from climate change. Those expected impacts can be estimated but are highly uncertain.
A.7	Wild Horses (under Miscellaneous)	Maybe	No	Yes	The study cited shows that additional wild horses beyond the target level cause economic losses due to reduced forage for livestock and wildlife.

Economists regularly quantify the value of ecosystem goods and services in dollar terms. Techniques used to estimate the dollar value of these benefits include:

- Revealed Preference Methods
    - Hedonic Pricing
    - The Travel Cost Method
- Expressed Preference Methods
    - Contingent Valuation
    - Welfare Measures
- Replacement Cost Method
- Dose-Response Methods
- Opportunity Cost Calculation

Revealed preference methods of valuation estimate proxy market prices based on the activities and choices made by actual people:

- In the hedonic pricing method of assessing value, the analyst identifies the contribution that environmental or ecosystem services make to the price of other goods and or services. For example, a piece of land or home with a scenic view will generally command a higher market price than does a similar piece of land or home without the same view. So if a thriving ecosystem provides a more beautiful view, the difference in price between that property and one without the view would be attributed to the ecosystem itself.
- To use the travel cost method of analyzing the value of ecosystem goods or services, the analyst surveys the amount of money people either are willing to spend or actually spend on visits to a particular place. Expenditures on fuel, vehicle wear and tear, airfares, motels or hotels, restaurant food, entry fees, and so on can be interpreted as the value placed by the traveler on the experience of visiting that location. Complicating factors include income effects, differences in the values placed by visitors on the time they spend traveling to the location, proximity of the location to the visitor's starting point, declining willingness to spend money on subsequent visits, and so on.

Expressed preference methods use hypothetical economic data based on interviews or surveys to estimate the market value of ecosystem goods and services:

- Contingent valuation methods rely on surveys in which people are either asked how much they would be willing to pay to obtain an ecosystem good or service, or they are asked to state how much they would have to be compensated in dollars in exchange for giving up an ecosystem good or service. For example, a group of landowners might be asked how much they would each be willing to pay in order to establish a specific wildlife population on a nearby piece of public land. The total amount for all surveyed landowners could be used as a statistical basis for an approximation of the market value of establishing the proposed wildlife population. Alternatively, the same landowners could be asked how much they would have to be paid in compensation in order to get them to give up an existing wildlife population on nearby land. Contingent valuation methods are sometimes less than ideal due to strategic "voting" by survey participants. They are also subject to some unsurprising distortions. People are usually more conservative when they state how much they would be willing to pay to obtain something in contrast with how much they would have to be paid by someone else in order for them to give up something they already possess or that they might possess in the future.
- Welfare measures of value refer to methods in which the total consumer well-being (welfare) associated with an ecosystem good or service is measured by comparing the estimated dollar amounts that all prospective consumers are willing to pay for an ecosystem good or service are

compared with the actual cost to society of providing that good or service. To the degree to which the actual cost falls below the amount individuals are willing to pay, an economist would say that consumer surplus or, in other words, surplus economic enjoyment, is (or will be) generated by the good or service being evaluated.

In the replacement cost method, economists add up the amount it would cost to provide a specific ecosystem good or service by means of a human-built method. For example, vegetation on a healthy landscape provides water filtration benefits. To calculate the monetary value of those filtration benefits using this method, an economist would use engineers' estimates of the cost of building one or more water treatment plants to treat the same volume of water to the level as provided by the ecosystem. This method can also be used to estimate the value of ecosystem services that are expect to be obtained through restoration of a degraded landscape.

The dose-response method is used to estimate the value of a healthy ecosystem by identifying the cost of treatment for ecological damages where treatment or mitigation is required locally, downstream, or downwind. For example, if a degraded ecosystem allows elevated levels of nutrients to pollute a water body that is a source of drinking water at some point downstream, then the cost of treating human and/or livestock illnesses caused by the polluted water can be used to estimate some of the value of repairing the ecosystem so that nutrient runoff is reduced or eliminated. Similarly, the cost of water treatment downstream to remove the nutrient load (thus preventing contamination-related illnesses) can also be used to approximate the value of upstream ecosystem restoration. This method is sometimes closely correlated with the replacement cost method.

In the opportunity cost method of valuation, the following simple rule is applied: The value of something is equal to the value of whatever must be given up in order to obtain it. Based on the rules of mathematical equality, this must mean, conversely, that the value of what was given up is equal to the value of what was obtained in the exchange. This method is sometimes used to make a statement regarding the value of an ecosystem when a damaging activity either is proposed or has already occurred. For example, if a new gold mine is opened on a piece of land, then the total value of the ecosystem goods and services that were given up in order for the mine to be opened and operated is said to be equal to the total economic value generated by the mine.

These and other methods all provide means of quantifying, in dollars, the value of goods and services not directly traded in existing markets. Many of the goods and services provided by healthy rangeland ecosystems are already traded in existing market systems and could be valued by means of identifying the quantities and qualities in which they exist. The estimation of the market value of all of the goods and services provided by the rangeland in this set of allotments falls outside the scope of the present analysis.

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

Activity*	Visitor Days	1995 Value ($)
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: Population and race/ethnicity distribution by county

	Owyhee County	Malheur County	Elko County
Total Population	11,389	31,326	47,707
Race Distribution			
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%
Ethnicity Distribution			
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 Two or more alternatives

A number of alternatives call for reductions from current AUM levels. In some cases, as described below, some the operator 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 2014 are $6.89/AUM in Idaho and $8.48/AUM in Oregon (in 2012)[79]. 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[80], 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

[79] 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 included in some of the estimates for grazing fees on private lands.

[80] 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.

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[81]. 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.

3.13.2 Direct and Indirect Effects

Table SOCE-12 shows the average impact on expected 10-year net revenue for the Garat allotment. The impacts are based on a detailed analysis that incorporates a sample partial enterprise budget showing the potential impact of each alternative on that part of the enterprise affected, based on information provided by a local ranch operator that was reviewed by a BLM rangeland manager (see Explanation of Model in Appendix K). These values assume that the animals use all of the active use AUMs authorized.

In Table SOCE-12, the results show the differences in 10-year net revenue when comparing the changes in AUMs in Alternatives 2 through 5 with the baseline AUMs in Alternative 1. The values in this table 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 among the following responses: 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

[81] 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.

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 above). In addition, canceling grazing on any BLM-administered pasture for 1 or more years (e.g., resting a pasture) could impact grazing revenue brought in by the State of Idaho because any unfenced State-administered grazing land located within a rested BLM-administered pasture could not be grazed by a State grazing lessee. The State lessee could request that he or she not be charged a State grazing fee during that time, and the loss of income to the State could impact funding for other State programs.

Even if AUMs were reduced in a pasture administered by the BLM, rather than cancelled completely, there may be an economic impact to the State's endowments as a result of any management changes on allotments that reduce AUMs on BLM lands. This depends on the Idaho Department of Lands (IDL) evaluation of rangeland conditions on State lands within the BLM allotments and whether changes are warranted on these lands. If IDL chooses to add or reduce AUMs on any State lands as a response to BLM management changes, there will be economic impacts to the State's endowments; if no additions or reductions on State lands are made, the economic impact to the State's endowment may be minimal. The impacts to State lands can be analyzed only after the IDL decides whether to make management changes on State lands in response to the BLM's final decisions for the Garat allotment; thus, there will be no further discussion of impacts to State endowments in this EA.

Petan Co. of Nevada's permitted AUMs for the Garat allotment also provide a value to the community, as seen in Table SOCE-13. This value considers the 10-year average market value of forage per AUM in Idaho from 2002 through 2011 on non-irrigated private ground, which is $12.67. The value of AUMs to the community is based on estimates by Darden et al (See Section 3.13.1 above).

Table SOCE-12: Impact on expected 10-year net revenue for each alternative for the Garat allotment

Alternative 1 (Baseline)		Alternative 2			Alternative 3		
Number of Cattle	Estimated Ten-year Net Revenue	Percent Change in Total AUMs over 10 Years	Ten-year $ Impact	Percent Change in Estimated Ten-year Net Revenue	Percent Change in Total AUMs over 10 Years	Ten-year $ Impact	Percent Change in Estimated Ten-year Net Revenue
2,955	$1,928,138	21%	-$769,228	-40%	3%	$300,413	16%

Alternative 4			Alternative 5		
Percent Change in Total AUMs over 10 Years	Ten-year $ Impact	Percent Change in Estimated Ten-year Net Revenue	Percent Change in Total AUMs over 10 Years	Ten-year $ Impact	Percent Change in Estimated Ten-year Net Revenue
-45%	-$4,123,582	-214%	100%	-$8,946,551	-464%

Table SOCE-13: Value of Garat allotment AUMs to the community

Alternative	% Change in AUMs	Change in Total AUMs	Total Active AUMs	Annual Dollar Value of Change	Net Annual Effect (Dollar Value of Change +/- Difference in Grazing Fees)	Value of AUMs to community
1 (No Action)	0%	0	18,870	$0	$0	$1,263,157
2	21%	3,880	22,750	$49,160	$43,922	$1,522,885
3	3%	630	19,500	$7,982	$7,132	$1,305,330
4	-45%	-8,520	10,350	-$107,948	-$96,446	$692,829
5 (No Grazing)	-100%	-18,870	0	-$239,083	-$213,608	$ 0

3.13.2.1 **Alternative 1 Effects**

Under Alternative 1, grazing permits for the Garat allotment would be renewed consistent with the summarized actions that have led to the current conditions. Authorized active use in the allotment would be consistent with the maximum actual use that has been made recently. Under Alternative 1, a permit to graze livestock on the Garat allotment would be renewed with the terms and conditions of the permit currently in effect, with changes made to reflect actions that have led to the current conditions. There would be no change in livestock management, operations would continue with business as usual, and there would be no additional socioeconomic impact to the ranches. Petan Co. would continue contributing to employment and the purchase and sale of goods and services in the counties where they are located.

3.13.2.2 **Alternative 2 Effects**

Implementation of the applicant's proposed action would result in an initial increase of active grazing use by 7 percent compared to Alternative 1, with the addition of 764 AUMs that were previously voluntary non-use AUMs, and increase active grazing use by 21 percent in years 4-10 of the permit. This alternative would authorize annual use of 22,750 active use AUMs in years 4-10, which is an increase of 3,880 active use AUMs over the maximum AUM use reported in 2006. Petan Co. would continue contributing to employment and the purchase and sale of goods and services in the counties where they are located, although they could incur additional transportation and feed costs.

3.13.2.3 **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 annually, retaining opportunity to support ranch income at current levels and greater than activated by the permittee in recent years.

3.13.2.4 **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 10,350 AUMs would be active and support grazing for 1,604 head of cattle annually, reducing opportunity for livestock sales and ranch income, but also reducing transportation and feed costs when compared to Alternative 1. Alternatives 4A, 4B, and 4C include the same number of AUMs in each option, but provide for different pasture rotations, which could affect transportation and feed costs.

3.13.2.5 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.

3.13.3 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 rancher applying for livestock grazing permit renewal maintains a base ranch near Tuscarora, Nevada; other ranchers who hold permits to graze on the other Owyhee 68 Group 1 allotments maintain base ranches in Jordan Valley, Oregon. 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 the Owyhee Field Office in Owyhee County (USDI BLM, 1999a), 407,473 active use AUMs permitted in the Malheur and Jordan Resource Areas in Oregon (USDI BLM, 2002), and 305,247 AUMs in Elko County (USDI BLM, 1987). Based on estimates from Darden et al (see Section 3.13.1 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.

Past, Present, and Reasonably Foreseeable Future Actions

The BLM Owyhee Field Office 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 environmental analyses and final decisions for grazing permits in a number of allotments.

Past actions taken regarding grazing permit renewals will affect the socioeconomic conditions in both counties because they influence decisions the operators make regarding their ranches. There are 116,993 active use AUMs permitted on public land in the Owyhee Field Office (135,116 active use AUMs at the time the 1999 ORMP was implemented (USDI BLM, 1999a) minus the 16,816-AUM reduction in the Final Decisions for the Owyhee 68 Groups 1-5 allotments, the 576-AUM reduction in the Final Decision for the Pole Creek Allotment Final EA (DOI-BLM-ID-B030-2009-0004-EA), and the 731-AUM reduction in the Final Decision for the Final Trout Springs and Hanley FFR EA (DOI-BLM-ID-B030-2009-0003-EA); the Final Decision for the Final Nickel Creek FFR EA (DOI-BLM-ID-B030-2011-0006-EA) includes no changes in AUMs) and 407,473 active use AUMs permitted in the Malheur and Jordan resource areas in Oregon (USDI BLM, 2002). Table SOCE-14 below shows the value to the community of AUMs for each of the alternatives in this EA, combined with the final changes in the Owyhee 68 allotments.

3.13.3.1 **Cumulative Effects for Alternatives 1-5**

For Alternatives 1-4, as long as the Petan Co. ranch remains in business, it 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 permit would mean that the land in the Garat allotment would still be allocated for grazing, as described in the ORMP, but grazing would not be permitted on the allotment for the life of the permit (10 years); if the rancher chose to close the ranch, the operator would no longer be contributing to employment or the purchase and sales of goods and services in the community. However, in 2013, BLM renewed grazing permits in the other Owyhee 68 Group 1 allotments, so the ranches associated with these permits will continue contributing to employment and the purchase and sale of goods and services in the local area. The U.S. government would continue contributing to the county through payments in lieu of taxes (PILT) which totaled more than $10.7 million in Owyhee County from 2005 to 2014, for an average of about $1.07 million per year. Ranching plays a large role in all three counties, so although the loss of the Petan Co. of Nevada ranch could impact the local communities, the loss, which is small in proportion to the total livestock operation's contributions to the three-county area, likely would not have a cumulative effect on a larger scale. However, AUM changes incorporated in the alternatives presented here, combined with final AUM reductions in the Owyhee 68 allotment permits, could have either positive or negative impacts to local suppliers, since the operator associated with the Garat allotment might choose to alter ranch operations in ways that would require either increases or reductions in supply purchases.

A number of permit renewals have been completed and implemented since implementation of the ORMP in 1999 that may have residual effects to the social and economic environment today. The cumulative effects to the social and economic environment analyzed in this EA are within the context of the following three analysis assumptions:

- When it was completed in 1999, the Owyhee Resource Management Plan (ORMP) identified 135,116 active use AUMs in the planning area (Proposed RMP at 23). The Final EIS projected that meeting the rangeland health objectives through the implementation of Alternative E (the selected RMP) would cause substantial adjustments to be made in livestock grazing throughout the planning area (EIS at IV-269). The EIS concludes in the effects to livestock management Section (IV-271) that active use AUMs would decrease 22 percent, or about 30,000 AUMs over the estimated 20-year life of the plan. The level of AUM reductions analyzed in the grazing alternatives in this EA, added to all AUM reductions implemented in other permit renewal actions within the planning area, would result in 116,993 active use AUMs permitted, and would be within the AUM reduction levels analyzed in the Final ORMP/EIS (105,899 AUMs by 2019)[82].
- In pursuit of meeting the resource objectives in the ORMP as well as the Standards for Rangeland health, the above AUM numbers are approximate estimates and future authorized levels of livestock use may change. If future AUM reductions within the Owyhee Field Office are greater than those analyzed in the ORMP/EIS, they will be subject to further NEPA analysis.
- The CEQ regulations state that the *"Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8)). This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment* (40 CFR 1508.14). The

[82] This document tiers to the ORMP Final Decision and incorporates the Final ORMP EIS by reference.

effects analysis in this EA discusses the social, economic, natural, and physical environment in this context.

Table SOCE-14: Total value of Owyhee 68 Groups 1-6 permitted AUMs to the community[1]

Alternative	Garat[2]	Groups 1-6	Total
1 (No Action)	$1,263,158	$1,482,301	$2,745,459
2	$1,522,885	$1,482,301	$3,005,186
3	$1,305,330	$1,482,301	$2,787,631
4	$692,829	$1,482,301	$2,175,130
5 (No Grazing)	$0	$1,482,301	$1,482,301

[1]Based on estimates by Darden et al (See Section 3.13.1 above)
[2] This table shows the value of AUMs to the community, which includes the value of AUMs permitted in Groups 1-6 plus the value of AUMs in each alternative for the Garat allotment

3.14 Cultural/Paleontological Resources

The Garat allotment 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, 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.

Paleontological Resources

Paleontological resources (fossils) have long been recognized for their scientific, educational, and recreational value. A fossil is any evidence of past life, and includes body fossils such as shells and bones, as well as trace fossils such as footprints, burrows, trails, or other evidence of an organism's presence. Fossils are preserved in rocks and are usually discovered when they are eroding out of the rock at the surface, or during ground-disturbing activity such as road grading or trenching. Most individual organisms that lived in the past did not die in such a way as to have their remains fossilized, and fewer still will be collected and studied before they erode away. Therefore, fossils are considered rare and nonrenewable.

All fossils contain information about past life, but not all fossils are significant. Significant fossils are those that are unique, unusual, or rare, are diagnostic, stratigraphically important, and add to the existing body of knowledge. In order to determine a fossil's significance, an assessment must be made by someone who is experienced in the field of paleontology, and who possesses a sufficient mastery of the existing body of knowledge to understand how a given fossil contributes to our overall understanding.

The BLM has managed fossils as a valued resource for many years. Legal authority to manage fossils comes from a variety of laws, executive orders, and policies. The laws include NEPA of 1969 and the FLPMA of 1976. More recently, the Paleontological Resources Preservation subtitle of the Omnibus Public Land Management Act of 2009, also known by its popular name, the Paleontological Resources Preservation Act (PRPA), directs land managers within the Department of the Interior Agencies and the U.S. Department of Agriculture, but not including either Indian or Military (Department of Defense) lands, to manage and protect fossils using scientific principles and expertise. PRPA does not make a distinction between the types of organism preserved; therefore, all fossil resources, plants, invertebrates, and vertebrates that are determined to be scientifically significant are to be actively managed.

The resources are managed in collaboration with BLM partners such as universities and museums across the country, as it is those parties that provide much of the work done on collecting, studying, storing, and providing meaning to our fossil resources. Additionally, BLM and our partners strive to educate the public about the value of this natural heritage.

In general, the desired outcomes for the paleontological resource is to: 1) protect the resource from unnecessary damage, theft, or vandalism; 2) ensure that the resource is responsibly collected by qualified individuals working to benefit the public through their actions; 3) utilize the resource in educational programs for the general public; and 4) teach the public about BLM's role in the management of this important resource.

The impact to fossils from the management of other resources on BLM land can be negligible to deleterious, depending up on nature of those actions. However, by maintaining best practices for the identification of resources and the mitigation of damage, the paleontological resources should continue to remain an invaluable part of the national trust.

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.

3.14.1 Affected Environment – Cultural Resources

The Garat allotment is the largest allotment in the Owyhee Field Office. Sixteen project-related cultural resources surveys have been conducted within the allotment, totaling 230 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. One site in the Garat allotment, 10OE3165, has been monitored since its initial recording. It is not within 100 meters of a congregation area and is not being impacted by grazing activities.

3.14.2 Affected Environment – Paleontology

Current geologic information about fossil bearing strata for the Garat allotment is incomplete. Only a narrow, intermittent corridor at the allotment's 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 resting on the same formation.

The effects to paleontological resources are similar to those discussed for cultural resources. Breakage, displacement and the consequences related to biomass reduction are the primary areas of concern. However, due to the absence of recorded fossil sites in the Garat allotment, no paleontological resources would be affected by this undertaking and no further analysis will be done for this resource.

3.14.3 Direct and Indirect Effects

3.14.3.1 Alternative 1 Effects

Alternative 1 would renew the grazing permit under the terms and conditions consistent with the current situation. 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 could cause greater compaction, displacement and transport away from a site's matrix. Artifacts and features could 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 the loci of livestock congregation areas and surrounding areas up to 50 meters away, however, there are no recorded sites within a 100-meter vicinity of the identified livestock congregation areas in the Garat allotment. Therefore, no historic properties would be affected by this alternative.

3.14.3.2 **Alternative 2 Effects**

Under this alternative, the grazing season would be the same as in Alternative 1. Active use AUMs would increase 7 percent during the first 3 years of the 10-year permit and 21 percent between years 4 and 10, as compared to the current situation (Alternative 1). 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 the number of livestock if new congregation areas are created near recorded or undiscovered site locations. A significant rise in the number of animals could exacerbate the effects of trampling to cultural properties if they are not well dispersed.

Although projects were proposed by the applicant for renewal of the grazing permit, those projects were considered, but not analyzed in detail. Proposed new fence construction or the removal of old fence lines and/or any new range improvement projects suggested in this alternative requires a cultural resources inventory prior to implementation. With NHPA Section 106 compliance completed, no historic properties would be affected.

3.14.3.3 **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 the number of livestock is minimal and the impacts would be the same as in Alternative 1. No historic properties would be affected.

3.14.3.4 **Alternative 4 Effects**

Under Alternative 4A, seasonal restrictions would be the primary tool to limit the negative effects of livestock grazing to vegetation, soil, wildlife habitat, and riparian resources in the allotment. A decrease in active use numbers of 45 percent is also proposed. Any lessening of livestock use could potentially reduce the threat of trampling and other effects at some sites. Any recovery of vegetation at these areas could alleviate the effects of erosion and provide better cover to deter illegal collecting. This alternative would tend to enhance the preservation and protection of cultural resources compared to Alternative 1. No historic properties would be affected.

Alternative 4B would use the same grazing schedule and active use numbers as Alternative 4A and would implement the use of livestock management practices (e.g., herding, salt and supplement placement and livestock movement) to protect riparian areas. These practices would result in the formation of livestock congregation areas or could create other ground disturbances that would require NHPA compliance prior to implementation. With the completion of compliance surveys and possible mitigation, it is determined that no historic properties would be affected.

Alternative 4C would use the same grazing schedule as in Alternative 4B. Actions would be the same as described in Alternative 4A with the exception of a 0.3 mile water gap access for livestock in Pasture 4. The proposed access area was inventoried for cultural resources in July 2014, and no sites were recorded as a result. No historic properties would be affected by this alternative.

3.14.3.5 **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 could continue, but if ground cover increased from a lack of foraging and trampling, cultural material could be better hidden and protected. Of all the alternatives, this alternative would best protect and preserve cultural resources from any effects of livestock grazing. No historic properties would be affected.

3.14.4 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 a 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.

3.14.4.1 Alternatives 1-4 Cumulative Effects

In general, previous impacts to cultural sites may include unsurveyed range improvements, animal congregation, artifact collecting and natural occurrences. All proposed 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 temporary trough areas, are surveyed as they become known or proposed. 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. There are suggestions of range improvements proposed under Alternative 2 that were considered, but not analyzed in detail. If these or other projects were to be pursued outside the permit renewal process, they would undergo the mandatory compliance procedures associated with a separate NEPA process. There are no other undertakings known to be planned for this general area that would affect cultural resources. No significant cumulative impacts are expected under these alternatives.

3.14.4.2 Alternative 5 Cumulative Effects

General impacts and effects to cultural resources are explained above; however, due to the absence of livestock and any proposed ground disturbing projects, cumulative impacts would not be expected under this alternative.

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
January 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 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, Quinton 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 15, 2014	2014 Garat Allotment Rangeland Health Assessment and Evaluation Report, 2014 Garat Allotment Determination provided to the permittee
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.
August 21, 2014	BLM and Garat Allotment Grazing permittee – Petan Co of Nevada – YP Ranch, John Jackson (owner); also, range consultants Western Range Services and Alan Schroder

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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.

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, 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

Bailey, D. W., & Brown, J. R. (2011). Rotational grazing systems and livestock grazing behavior in shrub dominated semi-arid and arid rangelands. *Rangeland Ecology and Management, 64*(1), 1-9.

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.

Barnett, J. K., & Crawford, J. A. (1994). Pre-laying Nutrition of sage grouse hens in Oregon. *Journal of Range Management, 47*(2), 114-118.

Beck, J. L., & Mitchell, D. L. (2000). Influences of livestock grazing on sage-grouse habitat. *Wildlife Society Bulletin, 28*, 993-1002.

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., & 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.

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.

Bilotta, G. S., Brazier, R. E., & Haygarth, P. M. (2007). The impacts of grazing animals on the quality of soils, vegetation, and surface waters in intensely managed grasslands. *Advances in Agronomy, 94*, 237-280.

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.

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.

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.

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.

Burkhardt, J., & Sanders, K. (2010). *Management of Growing Season Grazing in the Sagebrush Steppe.* Owyhee Science Review Program.

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

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.

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., 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., 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.

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

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

DeLong, A. K., Crawford, J. A., & Delong, Jr., D. C. (1995). Relationships 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

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, D. J., & Greene, R. (1994). Microbiotic soil crusts - a review of their roles in soil and ecological processes in the rangelands of Australia. *Australian Journal of Soil Research, 32*(3), 389-415.

Eldridge, S. (2004). *Soil management for dairy and beef cattle grazing.* Orange, Australia: NSW Agriculture. 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.

EPS-HDT. (2012). *A Profile of Socioeconomic Measures.* Headwaters Economics.

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

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.

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

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, J. S., & Flinders, J. T. (1980). *Brachylagus idahoensis, No. 125.* Washington, DC: American Society of Mammalogists. Retrieved from http://www.science.smith.edu/msi/pdf/i0076-3519-125-01-0001.pdf

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.

Gyssels, G., Poesen, J., Bochet, E., & Li, Y. (2005). Impact of plant roots on the resistance of soils to erosion by water: a review. *Progress in Physical Geography, 29*(2), 189-217.

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.

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.

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.

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., 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., Gomez, H., Molinar, F., & Galt, D. (1999). Grazing studies: What we've learned. *Rangelands, 21*(2), 12-16.

Holechek, J. L., Pieper, R. D., & Herbel, C. H. (1998). *Range Management Principles and Practices* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

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, 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

Idaho DEQ. (2014a). *Idaho Department of Environmental Quality Final 2012 Integrated Report.* Boise, ID. Retrieved from http://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf

Idaho DEQ. (2014b). *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 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, Boise, ID.

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. (2006). *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. (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. (2010d). *Idaho Bighorn Sheep Management Plan 2010.* Boise, ID. Retrieved from http://fishandgame.idaho.gov/public/wildlife/planBighorn.pdf

IDFG. (2011). *Idaho Fish and Wildlife Information System.* Retrieved August 2011, from https://fishandgame.idaho.gov/ifwis/portal/

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.

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.

Lambeck, R. J. (1997). Focal Species: A Multi-Species Umbrella for Nature Conservation. *Conservation Biology, 11*(4), 849-856.

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.

Launchbaugh, K., Brammer, B., Brooks, M. L., Bunting, S., Clark, P., Davison, J., . . . Wylie, B. (2008). *Interactions among livestock grazing, vegetation type, and fire behavior in the Murphy Wildland Fire Complex in Idaho and Nevada, July 2007.* USDI USGS.

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

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

Lusby, G. C. (1965). Causes of variation in runoff and sediment yield from small drainage basins in western Colorado. *Proceedings of the Federal Inter-Agency Sedimentation Conference, 1963.* USDA.

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.

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, May). 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

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.

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.

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.

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.

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

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

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.

Owyhee County Commissioners. (2009). *Owyhee County Natural Resources Plan.* Murphy, ID.

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.

Parsons, C. T., Momont, P. A., Delcurto, T., McInnis, M., & Porath, M. L. (2003). Cattle Distribution Patterns and Vegetation use in Mountain Riparian areas. *Journal of Range Management, 56*(4), 334-341.

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.

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

Portland State University. (2010). *Field Guide to Threatened and Endangered Plants of Oregon*. Retrieved from Oregon Biodiversity Information Center: http://orbic.pdx.edu/plants/view_lakes_plants.php

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

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.

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.

Reisner, M. D., Grace, J. B., Pyke, D. A., & Doescher, P. S. (2013). Conditions favouring Bromus tectorum dominance of endangered sagebrush steppe ecosystems. *Journal of Applied Ecology, 50*(4), 1039-1049. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12097/abstract

Rietkerk, M., & van de Koppel, J. (1997). Alternate stable states and threshold effects in semi-arid grazing systems. *Oikos, 79*(1), 69-76.

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.

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., 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

Sauer, R. H. (1978). Effect of Removal of Standing Dead Material on Growth of Agropyron spicatum. *Journal of Range Management, 31*(2), 121-122.

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.

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, 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

Strand, E. K., Launchbaugh, K. L., Limb, R., & Torell, L. (2014). Livestock Grazing Effects on Fuel Loads for Wildland Fire in Sagebrush Dominated Ecosystems. *Journal of Rangeland Applications*, 35 - 57.

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.

Teague, W. R., Dowhower, S. L., & Waggoner, J. A. (2004). Drought and grazing patch dynamics under different grazing management. *Journal of Arid Environments, 58*(1), 97-117.

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

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

Torell, L. A., Tanaka, J. A., Rimbey, N., Darden, T., Van Tassell, L., & Harp, A. (2002). *Ranch-Level Impacts of Changing Grazing Policies on BLM Land to Protect the Greater Sage-Grouse: Evidence from Idaho, Nevada and Oregon.* Caldwell, ID: Policy Analysis Center for Western Public Lands.

Tuason, T. (2005). *Boise District BLM Lepidium Davisii Monitoring Results from the Mountain Home Desert.* Boise: Bureau of Land Management.

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. (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.

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 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. (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 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.

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. (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. (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.* Marsing, 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. (2002). *Southeastern Oregon Resource Management Plan and Record of Decision.* Vale, OR.
USDI BLM. (2003). *Idaho Bureau of Land Management Sensitive Species List.* Instruction Memorandum ID-2003-057, Boise, Idaho.
USDI BLM. (2006). *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. (2011). *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation.* Interagency Technical Reference 1737-23, Denver, CO. Retrieved from http://www.blm.gov/nstc/library/pdf/MIM.pdf
USDI BLM. (2012). *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. (2014a). *Owyhee Canyonlands Wilderness and Wild & Scenic Rivers Management Plan and Environmental Assessment.* Boise and Twin Falls, Idaho: Bureau of Land Management Boise District and Twin Falls District Offices.
USDI BLM. (2014b). *Rangeland Health Assessment and Evaluation Report: Acheiving the Idaho Standards for Rangeland Health: Garat Allotment (0584).* Boise, Idaho: Bureau of Land Management Idaho State Office.
USDI USFWS. (1940). *Bald Eagle Protection Act of 1940*. Retrieved from http://www.fws.gov/laws/lawsdigest/BALDEGL.HTML
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. (2010). *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. (2011). *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 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

Van Poollen, H. W., & Lacey, J. R. (1979). Herbage Responses to Grazing systems and Stocking Intensities. *Journal of Range Management, 32*(4).

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. H., Ludwig, D., Holling, C. S., & Peterman, R. M. (1981). Stability of semi-arid savanna grazing systems. *Journal of Ecology, 69*(2), 473-498.

Warren, S. D., Thurow, T. L., Blackburn, W. H., & Garza, N. E. (1986). The influence of livestock trampling under intensive rotation grazing on soil hydrologic characteristics. *Journal of Range Management, 39*(6), 491-495.

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.

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.

7 APPENDICES

8 MAPS