BUREAU OF LAND MANAGEMENT

Rangeland Health Assessment and Evaluation Report

Achieving the Idaho Standards for Rangeland Health

Owyhee Field Office Group 1 Allotments

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Idaho BLM NEPA Permit Renewal Team

Rangeland Health Assessment and Evaluation Report

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Field Office: Owyhee Field Office
Allotment Name/Number: Castlehead-Lambert (0634)
Name of Permittee(s): 06 Livestock Co / 1101456 ; Collins Family LLC / 1103947

Standards for Rangeland Health

In 1997, the Idaho BLM adopted rangeland health standards (Appendix A - *Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management*), which were developed in coordination with the agency's three Resource Advisory Councils during the previous two years. The Standards outline the Bureau of Land Management's rangeland management goals for the betterment of the environment and sustained productivity of the range. They were developed with the specific intent of providing for the multiple uses of public lands managed by the BLM within Idaho. Application of the standards should involve collaboration between the authorized officer, interested publics, and resource users.

The eight standards of rangeland health are expressions of the level of physical and biological condition or degree of function required for healthy, sustainable rangelands, based on a number of indicators of rangeland health. Rangelands should be meeting or making significant progress toward meeting the standards through proper nutrient and hydrologic cycling and energy flow.

Appropriate to soil type, climate, and landform, indicators are a list of typical physical and biological factors and processes that can be measured and/or observed (e.g., photographic monitoring). They are used in combination to provide information necessary to determine the health and condition of the rangelands. Usually, no single indicator provides sufficient information to determine rangeland health, and only those indicators appropriate to a particular site are to be used. The indicators listed below each standard are not intended to be all-inclusive, and the issue of scale must be considered when evaluating each indicator. In some cases, individual isolated sites within a landscape may not be meeting the standards, but broader areas must be in proper functioning condition. Furthermore, fragmentation of habitat that reduces the effective size of large areas must also be evaluated for its consequences.

Rangeland Health Assessment and Evaluation Report

The Rangeland Health Assessment (RHA) is a compilation and analysis of all data and information available for an allotment or group of allotments that describes the current rangeland health conditions and identifies changes or trends in rangeland health over time. Permittees, interested publics, tribes, and state agencies were given an opportunity to provide information and data to be considered in the RHA. Rangeland Health Assessments are used in association with other quantitative monitoring and inventory information as a qualitative evaluation tool to provide early warnings of resource problems in rangeland uplands. The RHA procedure used for assessing the ISRH standards 1, 4, 5, and 6 compares 17 indicators to a reference state or Ecological Site Descriptions (USDA NRCS 2006 and 2010) and expresses a degree of departure from what is expected.

The Evaluation Report draws on monitoring reports on representative sites to determine rangeland health, condition and trend based on a number of indicators of rangeland health. It answers two major questions:

1. Is the allotment meeting the Idaho Standards for Rangeland Health (ISRH)?
2. If the allotment is not meeting the ISRH, is it making significant progress toward meeting the ISRH?

The analysis in the RHA is the basis for completing the Evaluation Report (ER). Some of the factors that might influence the current conditions include livestock grazing management, off-highway vehicles (OHV), wildlife concentration, roads, and trails. Current livestock grazing management and other uses are evaluated to conclude causes of any unsatisfactory conditions. Conclusions reached in the evaluation should describe all the factors and indicators and the scientific basis for each conclusion. The evaluation rationale should contain descriptions of each attribute or indicator that contributes to allotment(s) meeting or not meeting the standards.

2003 Assessments

Rangeland health field assessments (RHFA) were completed for the Castlehead-Lambert allotment in July 2001. Thirty-one RHFAs were completed to determine rangeland health within each of the five pastures (Appendix D). Protocols used were in accordance with techniques identified in BLM technical reference 1734-6 Interpreting Indicators of Rangeland Health-Versions 3 (USDI BLM 2000). The assessed areas primarily occur on Loamy 13-16” and Shallow Claypan 12-16” ecological sites, although a few Mahogany Savanna 16-22”, Shallow Breaks 14-18”, Stony Loam 10-14”, and Clayey 12-15” ecological sites were represented as well (Map 4). Information provided from data recorded at four trend plots (one in each pasture prior to the division of pasture 1; no trend data were available for pasture 5 – Horse) were also used to identify existing conditions in the Castlehead-Lambert allotment (Appendix C; Map 5). The Owyhee Field Office compiled the findings in the 2003 Assessments for Castlehead-

Lambert (0634) and Jordan Valley (0592) Allotments (USDI BLM 2003a), followed by determinations of causal factors where the ISRH were not met (USDI BLM 2003b).

2007 Crutcher Fire
In 2007, the Crutcher fire burned approximately 23,000 acres in Castlehead-Lambert allotment. With the exception of pasture 4 and portions of the eastern half of the allotment, the majority of the allotment was within the boundary of the fire (Map 3). Based on GIS fire information, only three sites from the 2001 RHFA in pasture 1, one site each in pastures 2 and 3, and nine sites in pasture 4 can therefore be considered unburned and have been incorporated into this evaluation report.

2011 Update
Subsequent to completion of the 2001 field assessments, Version 3 of the technical reference was updated by Version 4 (USDI BLM 2005). The techniques for qualitatively assessing rangeland health remained similar with indicators unchanged from Version 3.

Eleven additional RHFAs were completed in Castlehead-Lambert allotment during 2009, in accordance with the Version 4 protocols. Fourteen unburned sites from the 2001 RHFAs were added to the 11 RHFAs recorded in 2009, for a total of 25 sites considered for this assessment and evaluation report. Even though the data used to complete this report for Castlehead-Lambert allotment were from field assessments completed in 2001 and 2009, using protocols from two versions of the same technical reference, use of refined description of the process provided in Version 4 lead to appropriate conclusions based on multiple years when data were recorded.

Allotment and Livestock Grazing Management

The Castlehead-Lambert allotment includes 45,826 acres of public land, 217 acres of state land, and three acres of private land in six pastures (Table ALLOT-1). The allotment is located in Owyhee County, Idaho, approximately 30 miles southeast of Jordan Valley, Oregon. The allotment includes Lambert Table and is bordered by Juniper Mountain on the north, Owyhee River on the south, and Red Canyon on the west. (Map 1)

The allotment lies within the boundary of the Owyhee Field Office, which is in the Boise District. It includes portions of The Badlands Research Natural Area (RNA)/ Area of Critical Environmental Concern (ACEC) and Owyhee River Bighorn Sheep ACEC as designated by the Owyhee Resource Management Plan (ORMP) (USDI BLM 1999). Portions of the Owyhee River Wilderness and Owyhee Wild and Scenic River which fall within the allotment were designated in the Omnibus Public Lands Management Act of 2009 (P.L. 111-11).

Table ALLOT-1: Acreages by pasture and ownership within the Castlehead-Lambert allotment

Allotment	Pasture #	Pasture Name	Public	State	Private	Total [1]
Castlehead-Lambert	1	Castlehead	4,660	3	3	4,665
	2	Carter Springs	9,192	1	0	9,193
	3	Red Basin	11,328	0	0	11,328
	4	Lambert Table	11,544	213	0	11,757
	5	Horse Pasture	1,850	0	0	1,850
	6	Between-the-Canyons	7,252	0	0	7,252
Totals			45,826	217	3	46,046

[1] Total acres may not match the sum of individual ownership acres due to rounding numbers.

Elevations range from 4,700 feet near the confluence of Red Canyon and the Owyhee River breaks to more than 6,300 feet on the rhyolite summits on Juniper Mountain. The terrain is undulating to steep, due to ancient volcanic activity that formed foothills, structural benches, tablelands, and calderas across the landscape. Tablelands are primarily basalt in origin, while most of the other landform features are composed of welded rhyolite tuff and some breccia.

Allotment soils are diverse due to landscape position, climate, aspect, slope, elevation, vegetative communities, and parent material sources. Soils are shallow to moderately deep (with deeper inclusions), well drained, and generally have a xeric moisture regime. Upper elevation areas have a frigid soil temperature regime while the lower elevation sites are mesic bordering on frigid (USDA NRCS 2003).

The Squawcreek, Wickahoney, Zecanyon, Mulshoe, and Saturday soil series (USDA NRCS 2003) are representative of soils in the central and northern part of the allotment and are associated with the Shallow-Claypan 12-16”, Loamy 12-16”, and Loamy 13-16” ecological sites. These soils are typically loamy to clayey with high amounts of coarse fragments on the surface and in the profile.

The Deunah, Yatahoney, and Wickahoney soil series dominate Lambert Table and contain alluvial and residual parent material that derived from basalt. These soils are associated with the Clayey 12-15” ecological site and are shallow to moderately deep and well-drained, with frigid soil temperature regimes and xeric (arid) soil moisture regimes. Abrupt textural boundaries in the subsoil and stony surfaces are typical in these clayey soils.

Based on inherent soil characteristics, the soil erosion hazard from water on these soils is rated slight to moderate, with the exception of slopes greater than 30 percent, where erosion hazard is rated moderate to very high. However, surface rock fragments provide cover and can greatly modify runoff potential and sediment movement. Wind erosion hazard is low.

Currently, the northern half of the allotment is most affected by the expansion of western juniper (*Juniperus occidentalis*), primarily on Loamy 13-16" ecological sites. Where invasion is heavy, juniper are highly competitive for available moisture, nutrients, and understory photosynthetic needs, which adversely affects hydrological cycles, species composition, and vegetative density. See Appendix E for a list of common and scientific names of plants used in this document.

Livestock Grazing Management

The current total permitted use for livestock grazing in the Castlehead-Lambert allotment is 5,324 animal unit months (AUMs)[1], of which 3,244 AUMs are active and 2,080 AUMs are suspended (Table ALLOT-2).

Table ALLOT-2: Permitted use for individual permittees in the Castlehead-Lambert allotment

Permittee	Active Use	Suspended Use	Permitted Use
06 Livestock	1,915	1,272	3,187
Collins Family LLC	1,329	808	2,137

Pastures currently managed as portions of the Castlehead-Lambert allotment were originally part of the Trout Spring allotment (0539) in the Owyhee Rangeland Management Program Summary Report (USDI BLM 1981). That grazing management decision set a grazing period for the Trout Spring allotment of April 16 to September 30 annually, with a 2-year deferred rotation grazing schedule. Following that grazing management decision, the Castlehead (1 and 6[2]), Carter Springs (2), Red Basin (3), Lambert Table (4), and Horse (5) pastures were divided from the Trout Spring allotment to create the Castlehead-Lambert allotment. In 1982, a grazing system was established for the Castlehead-Lambert allotment that included a three-pasture rest-rotation schedule for pastures 2, 3, and 4. Grazing was deferred until after the active growing season every year in pasture 1. An approximate date for the end of the active growing

[1] 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.
[2] Castlehead pasture was identified as pasture 1 through 2005 when a division fence was constructed to divide the pasture, creating a new Castlehead pasture (now pasture 1) and Between-the-Canyons pasture (now pasture 6).

season for this allotment is late June or early July. This system has generally been followed since 1982, with modifications implemented to allow opportunity for recovery following wildfires (Appendix G: Actual Use/Utilization). Pasture 5 is adjacent to pasture 3 and is generally grazed in conjunction with pasture 3. In addition, pasture 5 has been used by domestic horses in accordance with terms and conditions of the permits.

Table ALLOT-3: Castlehead-Lambert allotment grazing schedule implemented in 1982

Pasture	Pasture Name	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1	Castlehead	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30	7/8 to 9/30
2	Carter Springs	5/21 to 7/7	Rest	5/21 to 7/7	4/16 to 5/20	5/21 to 7/7	Rest
3	Red Basin	4/16 to 5/20	5/21 to 7/7	Rest	5/21 to 7/7	Rest	5/21 to 7/7
4	Lambert Table	Rest	4/16 to 5/20	4/16 to 5/20	Rest	4/16 to 5/20	4/16 to 5/20

Recorded utilization data are limited from 1998 through 2009. The most recent data that were recorded from 2010 and 2011 identify that recent utilization levels have been less than the maximum allowable level of 50 percent set in livestock grazing management actions of the ORMP (Appendix G).

The ORMP, the land use plan for Owyhee Field Office, categorized Castlehead-Lambert allotment as an improved (I) category allotment with a high priority for management. Categorization of allotments in that land use plan prioritized development and implementation of grazing systems to meet multiple use resource objectives and rangeland health standards based on resource conditions, potentials, and concerns, as well as economics, present management, and other criteria.

Information Sources

USDA Natural Resources Conservation Service. 2003. Soil Survey of Owyhee County Area, Idaho. Available at http://soildatamart.nrcs.usda.gov/Manuscripts/ID675/0/Owyhee%20Text.pdf

USDA Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

USDA Natural Resources Conservation Service. 2006 and 2010. Ecological Site Descriptions. Available from the Idaho State Office of BLM, Boise ID or the Idaho State Office of NRCS, Boise ID.

USDI Bureau of Land Management. 1981. Owyhee Rangeland Management Program Summary Report. BLM Boise District, Idaho. 13p.

USDI Bureau of Land Management. 1999. Owyhee Resource Management Plan. Idaho BLM State Office.

USDI Bureau of Land Management. 2000. Interpreting Indicators of Rangeland Health-Version 3. Technical Reference 1734-6. Denver CO. 118 p.

USDI Bureau of Land Management 2003a. Assessment for Castlehead-Lambert (0634) and Jordan Valley (0592) Allotments. Owyhee Field Office. Marsing, ID. 95p.

USDI Bureau of Land Management 2003b. Determination; Achieving Standards for Rangeland Health and Conforming with Guidelines for Livestock Grazing Management: Castlehead-Lambert (0634). Owyhee Field Office. Marsing, ID. 11p.

USDI Bureau of Land Management. 2005. Interpreting Indicators of Rangeland Health-Version 4. Technical Reference 1734-6. Denver CO. 122 p.

Standards:

Standard 1 – Watersheds

__ Standard Doesn't Apply

Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, vegetation, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include but are not limited to:

1. The amount and distribution of ground cover, including litter, for identified ecological site or soil-plant associations are appropriate for site stability.
2. Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/ surface sealing, and compaction layers below the soil surface is minimal for soil type and landform.

Rangeland Health Assessment

Twelve of the 17 indicators utilized in the Rangeland Health Field Assessments (RHFAs) are related to Standard 1 - Watershed Health. The analysis of watershed condition considers both soil stability and hydrologic indicators (Pellant et al. 2005) and displays a natural range of physical and vegetative characteristics (USDA-NRCS 2003a). Table SOIL-1 summarizes all indicator ratings and corresponding percentages related to Standard 1 by pasture.

For example, seven sites were evaluated in pasture 1, for a total of 84 indicator ratings related to watersheds. Of these, 20 were rated as having a slight-to-moderate degree of departure from reference site conditions. Detailed indicator ratings by site are included in Appendix D.

Table SOIL-1: Summary of watershed-related indicator ratings by pasture from 2001 (unburned) and 2009 RHFAs (Appendix D)

Standard 1 Watersheds	Degree of Departure									
	None to Slight		Slight to Moderate		Moderate		Moderate to Extreme		Extreme	
	#	%	#	%	#	%	#	%	#	%
Pastures 1 & 6[1] – Castlehead & BTC*	60	71	20	24	4	5	0	0	0	0
Pasture 2[2] – Carter Spring	24	67	9	25	3	8	0	0	0	0
Pasture 3[3] – Red Basin	30	83	4	11	2	6	0	0	0	0
Pasture 4[4] – Lambert Table	90	68	31	23	11	8	0	0	0	0
Pasture 5[5] – Horse	10	83	2	17	0	0	0	0	0	0

[*] Pastures 1 and 6, 'Castlehead' and 'Between-the-Canyons' (BTC), were combined due to previous naming conventions.
[1] Summarizes ratings for: 1 Loamy 10-16"; 2 Mahogany Savanna 16-22"; and 4 Loamy 13-16"site.
[2] Summarizes ratings for: 1 Stony Loam 10-14; 1 Loamy 12-16"; and 1 Shallow Claypan 12-16" site.
[3] Summarizes ratings for: 1 Shallow Breaks 14-18"; and 2 Shallow-Claypan 12-16" sites.
[4] Summarizes ratings for: 2 Clayey 12-16"; 2 Clayey 12-15"; 2 Shallow Claypan 12-16"; and 5 Loamy 12-16" sites.
[5] Summarizes ratings for: 1 Loamy 13-16" site.

The interpretation process is the critical link between observations of indicators and determining the degree of departure from reference conditions. RHFA monitoring sheets, photos, functional group descriptions, cover class percentages, and site documentation for species abundance and dominant life forms were utilized in an interdisciplinary team setting to aid in the interpretation of attribute ratings (Table SOIL-2).

Changes from previous decisions made in 2001 were applied where necessary, based on the array of available information. Reference sheets were not available for the 2001 and 2009 RHFA data, so the ecological site descriptions specific to each monitoring site location were used to provide for interpretation of departure from reference conditions (Map 4).

Table SOIL-2: Summary of 2011watershed related RHFA attribute ratings and overall ratings for the Castlehead-Lambert allotment (Appendix D)[#]

Pasture Name	Sites Total & Overall Rating**	Soil/Site Stability										Hydrologic Function									
		n-s		s-m		m		m-e		e		n-s		s-m		m		m-e		e	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Pastures 1 & 6 Castlehead & BTC*	7 s-m	4	57	2	29	1	14	0	0	0	0	3	43	4	57	0	0	0	0	0	0
Pasture 2 Carter Spring	3 s-m	1	33	2	67	0	0	0	0	0	0	1	33	2	67	0	0	0	0	0	0
Pasture 3 Red Basin	3 m	2	67	1	33	0	0	0	0	0	0	2	67	1	33	0	0	0	0	0	0
Pasture 4 Lambert Table	11 s-m	0	0	9	82	2	18	0	0	0	0	5	45	6	5	0	0	0	0	0	0
Pasture 5 Horse	1 m	1	100	0	0	0	0	0	0	0	0	1	100	0	100	0	0	0	0	0	0

*Pastures 1 and 6, 'Castlehead' and 'Between-the-Canyons' (BTC), were combined due to previous naming conventions
[#]Includes all 2009 data and only unburned 2001 sites.
**Final ratings are not exclusively based on the displayed watershed-related indicators and relied on a summary of all available information.

A "preponderance of evidence" approach was used to select the appropriate departure category for each attribute. The decision was based on where the majority of indicators for each attribute fell and included professional judgment that considered whether an indicator was particularly important for the site. Water flow patterns, susceptibility to soil surface loss or degradation, and resistance to erosion indicators were consequently given more weight during the determination of overall ratings. Such an approach therefore excluded the use of a numerical indicator tally and heavily relied on a summary of all available information.

Ground cover data collected from 1984 to 2011 (with earlier years missing at some locations) is available for four trend sites and represent one site per pasture, excluding pasture 5 (Horse) (Appendix C). These data provide quantitative records that reflect long-term and short-term changes for ground cover, which consist of basal and total vegetation, rock, gravel, biologic crust, persistent and non-persistent litter, and canopy cover.

For this assessment, *long-term* represents the full length of time between the first and last reading (e.g. comparing 1986 to 2011 for the Castlehead pasture) and *short-term* reflects a comparison between the 2011 and its immediately previous reading. Data may or may not show statistical significance or reflect a direction change in conditions.

Pastures 1 and 6 – Castlehead and Between-the-Canyons[3]

Fire: The 2007 Crutcher fire affected 1,014 acres (22 percent) in pasture 1 and 6,105 acres (84 percent) in pasture 6 (Map 3).

Rangeland Health: Seven RHFAs were completed in the Castlehead and Between-the-Canyons (BTC) pastures: one in Loamy 10-16", two in Mahogany Savanna 16-22", and four in Loamy 13-16" ecological sites (Appendix D; Map 4). Seventy-one percent of the indicators were in the none-to-slight range of departure from reference site conditions, 24 percent were in the slight-to-moderate range, and 5 percent were in the moderate range (Table SOIL-1). As a whole, the Castlehead and BTC pastures have a slight-to-moderate degree of departure from reference conditions for soil/site stability and hydrologic function (Table SOIL-2).

Water flow patterns are short and stable, especially when rock and gravel are present, as they provide effective armor against erosional processes. Loss of desirable grass and shrub cover associated with an increase in juniper, however, contributes to increased bare ground and lower soil stability.

Localized rilling was observed at one of the Mahogany Savanna sites and in the burned area of a Loamy 13-16" site. The latter location also displays the onset of a gully that increases the potential for erosion.

No signs of lingering negative post-burn effects on soils, such as increased hydrophobicity (water repellency), excessive overland flow, and associated erosion were noted in areas that burned in 2007. Based on 2009 observation notes and indicator ratings that show few departures from reference conditions, the allotment benefitted from the 2-year rest from grazing after the fire, the removal of juniper, and the re-establishment of vegetation.

However, despite the 2007 Crutcher fire, not all juniper vegetation burned, leaving behind a variable mosaic across the landscape. Large portions of the Castlehead and Between-the-Canyons pastures still contain pockets of juniper of various age classes within the burn area, as well as some of the highest amount of juniper within the allotment (Map 6).

Trend: Ground cover trend data were collected from 1986 to 2011 but was affected by the 2007 Crutcher fire (Appendix C; Map 5). Total vegetation, basal vegetation, canopy cover, and persistent litter, as well as rock, gravel, biological crust, and persistent litter (after this referred to as biological crust only) show a statistically significant long-term and short-term decrease, while non-persistent litter shows a long-and short-term increase. Data indicate that bare ground remains static.

[3] Pastures 1 and 6 (Castlehead and Between-the-Canyons) were combined due to previous naming conventions.

Pasture 2 – Carter Spring

Fire: The 2007 Crutcher fire burned 4,046 acres (44 percent) in pasture 2 (Map 3).

Rangeland Health: Three RHFAs were completed in the Carter Springs pasture: one in Stony Loam 10-14", one in Loamy 12-16", and one in Shallow Claypan 12-16" ecological sites (Appendix D; Map 4). Sixty-seven percent of the indicators were in the none-to-slight range of departure from reference site conditions, 25 percent were in the slight-to-moderate range, and 8 percent were in the moderate range (Table SOIL-1). As a whole, the Carter Spring pasture has a slight-to-moderate degree of departure from reference conditions for soil/site stability and hydrologic function (Table SOIL-2).

Water flow patterns are non-defined for two sites and are connected and longer than expected in the third. Pedestalling of bunchgrass in the interspatial areas is evident, particularly west of Carter Spring, where pedestals are associated with long interconnected surface flow activity. In other portions of the pasture, historic pedestals are present as the result of past erosional episodes that have since stabilized. In 2009, little to no recent active formation of pedestals was observed.

While a lack of biological soil crust was noted for all sites, the presence of surface rock and gravel aids in the stabilization of soils when present. In areas of juniper encroachment, annuals often replace bunchgrasses, especially in associated interspaces. Areas that burned show good vegetative recovery with increased production compared to unburned areas.

Trend: Ground cover trend data were collected from 1984 to 2011 (Appendix C; Map 5). Total vegetation and canopy cover show a statistically significant long-term and short-term increase, while biological soil crust remains static. Bare ground and basal vegetation cover display a statistically significant short-term increase but are otherwise decreasing in the long-term. The reduction in bare ground may be linked to non-persistent litter that has decreased after a short peak in 2007 pre-fire data but overall displays a statistically significant long-term increase.

Pasture 3 – Red Basin

Fire: The 2007 Crutcher fire burned 9,875 acres (87 percent) in pasture 3 (Map 3).

Rangeland Health: Three RHFAs were completed in the Red Basin pasture: one in Shallow Breaks 14-18" and two in Shallow-Claypan 12-16" ecological sites (Appendix D; Map 4). Eighty-three percent of the indicators were in the none-to-slight range of departure from reference site conditions, 11 percent were in the slight-to-moderate range, and 6 percent were in the moderate range (Table SOIL-1). As a whole, the Red Basin pasture has a none-to-slight degree of departure from reference conditions for soil/site stability and hydrologic function (Table SOIL-2).

Water flow patterns are minimal at Shallow Claypan sites and longer and more interconnected at the Shallow Breaks site and fall within expectance levels for these ecological sites. Historic pedestaling is present, but active formation is rare. Lack of biotic crust is evident in interspaces that also display reduced soil stability. During the 2009 monitoring season, no increase in water erosion was observed, suggesting stable hydrologic function due the inherent presence of increased surface rock and gravel content. A post-fire increase in grass production and vigorous seed head production was noted, often leaving abundant litter around the bunchgrasses.

Trend: Ground cover trend data were collected from 1988 to 2011 (Appendix C; Map 5). Basal vegetation cover and biological crust show a statistically significant long-term decrease but increased short-term. Bare ground does not show any long- or short-term changes, while total vegetation cover has been static over the long-term and increasing in the short-term.

Pasture 4 – Lambert Table

Fire: The 2007 Crutcher fire burned 144 acres (1 percent) in pasture 4 (Map 3).

Rangeland Health: Eleven RHFAs were completed in the Lambert Table pasture: two in Clayey 12-16", two in Clayey 12-15", two in Shallow Claypan 12-16", and five in Loamy 12-16" ecological sites (Appendix D; Map 4). Sixty-eight percent of the indicators were in the none-to-slight range of departure from reference site conditions, 23 percent were in the slight-to-moderate range, and 8 percent were in the moderate range (Table SOIL-1). As a whole, the Lambert Table pasture has a slight-to-moderate degree of departure from reference conditions for soil/site stability and hydrologic function (Table SOIL-2).

Lambert Table is the only pasture in the Castlehead allotment that was not impacted by the 2007 Crutcher fire (except for 144 acres along the northern rim), which allowed for all of the 2001 and 2009 RHFA monitoring to be utilized. It is also the only pasture in the allotment that was not rested between 2008 and 2009.

Water flow patterns are non-defined or short for most sites, except in draws, where a slight slope increase in the otherwise flat terrain can support runoff. Pedestalling of bunchgrass in the interspatial areas is evident but primarily historic and inactive on all but three sites where more recent root exposures display erosion. Bare ground is more than expected at several sites and shows reduced stability ratings in interspaces compared to vegetated areas. A lack of biological soil crust is noted for several sites, with one showing mechanical damage to soil crust and compaction, especially after soils were wet. High inherent levels of rock and gravel aid in the stabilization of soils.

Trend: Ground cover trend data were collected from 1988 to 2011 (Appendix C; Map 5). Non-persistent litter shows that the only statistically significant changes are an increase in the long-term and a decrease in the short-term. All other trends recorded were not statistically significant. This includes biological crusts that are static in the long-

term with a short-term increase, bare ground that decreased in the long-term, and canopy cover that increased in the long-term. Basal and total vegetation remain static.

Pasture 5 – Horse

Fire: The 2007 Crutcher fire burned 1,848 acres in pasture 5 (Map 3).

Rangeland Health: One RHFA was completed in the Horse pasture in a Loamy 13-16" ecological site (Appendix D; Map 4). Eighty-three percent of the indicators were in the none-to-slight range of departure from reference site conditions and 17 percent were in the slight-to-moderate range (Table SOIL-1). As a whole, the Horse pasture has a none-to-slight degree of departure from reference conditions for soil/site stability and hydrologic function (Table SOIL-2).

Water flow patterns are non-defined. Previous juniper encroachment and patchy hydrophobic conditions after the 2007 fire may have led to decreased soil stability along with past historic loss, leaving behind few inactive pedestals. Bare areas are rare and isolated and contain gravelly surfaces in the majority of interspaces. Infiltration appears to have improved with the removal of juniper by fire. Though some invasive species are present, increased seed head production of healthy perennial bunchgrasses was noted.

No trend data are available for this pasture.

Evaluation of Standard

Evaluation Finding – allotment/watershed is:
__x_ Meeting the Standard
____ Not meeting the Standard, but making significant progress towards meeting
____ Not meeting the Standard

Desired Conditions:

1999 Owyhee Resource Management Plan:

Livestock Grazing Management

- LVST 1: Provide for sustained level of livestock use compatible with meeting other resource objectives.
- MGMT ACTIONS: 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.
- Limit upland forage use to 50 percent unless higher or lower level of use is appropriate to meet standards for healthy rangelands.

Soil Resources

- 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).
- MGMT ACTIONS: Implement grazing practices that during and at the end of the grazing season provide adequate amounts of ground cover (determined on an ecological site basis) to support proper infiltration, maintain soil moisture, stabilize soils, and maintain site productivity.

The preponderance of evidence determined that the slight-to-moderate departure category best reflects the overall watershed condition on the Castlehead-Lambert allotment. Despite a slight-to-moderate rating, the limited departure of ground cover and soil conditions are somewhat similar to those present at ecological site potential (USDA-NRCS 2006 and 2010). Although localized soil impacts are recorded, soil and hydrologic integrity and their associated attributes are maintained and conclude that Standard 1 - Watersheds is being met.

However, vegetative composition as a whole is imbalanced in comparison to ecological potential where juniper is encroaching. Overall watershed condition is closely tied to the health of the biotic community and soil surface stability. Vegetation (upland and riparian) is the primary factor that influences the spatial and temporal variability of soil processes (USDA-NRCS 2003b) and as vegetation condition changes, so do runoff, erosion, and infiltration. The moderate departure in biotic integrity (Standard 4) is therefore a primary concern for watershed health over the long term.

Static conditions or slight improvements in upland vegetation cover due to rest from grazing during 2008 to 2009 after the 2007 Crutcher fire have slowly reduced bare ground and increased litter and will begin to decrease upland soil erosion and increase infiltration in the short term (3 to10 years). However, juniper encroachment in areas not affected by fire will continue to decrease soil cover necessary for nutrient cycling and site protection and increase the potential for accelerated soil erosion over the long-term (more than 20 years).

Areas of greatest concern are Castlehead, Between-the-Canyons, and Carter Springs pastures that contain the highest presence of late seral junipers. The long-term effects of soils loss from continued juniper encroachment would be a reduction in vegetation community productivity (Miller et al. 2005) and a high unlikelihood of restoring the communities in the future (Bunting et al. 2002).

Rationale for Evaluation Finding

2003 Assessment
The 2003 Determination states that Standard 1 - Watersheds – was not met in at least some portions of the allotment. Pastures 1, 2, and 5 exhibited a properly functioning vegetative community to maintain soil stability and watershed health, with a deferred grazing system in pasture 1 being identified as a major factor contributing to this rating.

Portions of pastures 2 and 3 were considered at-risk due to various degrees of accelerated active erosional processes. Early season of use, when soils are saturated and grazing of key forage plants occur during the critical growth period, were identified as moving the system away from meeting the watershed standard.

Juniper encroachment into several pastures was noted as having undesirable impacts on the hydrologic, nutrient, and energy cycles of these systems. The occurrence of juniper was recognized as having long-term negative effects.

Current Information and Comparison with the 2003 Assessment
The 2007 Crutcher fire had the largest impact by affecting approximately 23,000 acres (50 percent of the allotment) to various levels within the Castlehead-Lambert allotment. With the exception of Lambert Table (pasture 4), the allotment was rested from livestock grazing from 2008 to 2009 following the fire.

Where upland vegetation was burned, juniper and shrubs were removed or reduced and provided annuals and perennials an opportunity to re-establish. Compared to juniper dominated sites, the 2009 RHFAs noted a general increase in vegetative production on burned areas which, in the long term, should provide additional soil stability to the landscape. Ground cover comparisons from trend monitoring data show little change to a slight upward trend in response to no grazing on two unburned sites in pastures 2 and 3 while the one burned trend site in pasture 1 shows significant declines in vegetation, which can be expected.

Additional post-fire monitoring has been conducted after emergency stabilization efforts were completed and provide for evaluation of effectiveness for several treatments (USDI-BLM 2010). Based on monitoring and general area visits conducted in 2008, the livestock closure was maintained and fully successful and, along with favorable growing conditions, fostered a moderate to high rate of natural recovery. The basal cover provided by the high occurrence of vigorous and healthy native perennial forbs and grasses mitigates the possibility of soil movement or sedimentation from runoff.

In areas where juniper encroachment dominated before the fire, the degree of recovery is slow, with initial low abundance and seed production of desirable shrubs, perennial grasses, and forbs for future expansion. A gradual upward trend can be expected since bare ground in these areas has decreased and canopy gaps are getting smaller (USDI-BLM 2010). However, since more durable soil cover elements show a notable delay in recovery, soil degradation is of greater concern where junipers once dominated.

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Standard 2 – Riparian Areas and Wetlands __ Standard Doesn't Apply

Riparian-wetland areas are in proper functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling and energy flow.

Indicators may include but are not limited to:

1. The riparian/wetland vegetation is controlling erosion, stabilizing streambanks, shading water areas to reduce water temperature, stabilizing shorelines, filtering sediment, aiding in floodplain development, dissipating energy, delaying floodwater, and increasing recharge of groundwater appropriate to site potential.

2. Riparian/wetland vegetation with deep strong binding roots is sufficient to stabilize streambanks and shorelines. Invader and shallow rooted species are a minor component of the floodplain.
3. Age class and structural diversity of riparian/wetland vegetation is appropriate for the site.
4. Noxious weeds are not increasing.

Rangeland Health Assessment

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

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

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

According to the National Hydrologic Dataset (NHD), the Castlehead-Lambert allotment contains approximately 22 miles of perennial and more than 100 miles of intermittent streams[4] (Table RIPN-1). The NHD does not differentiate between intermittent and ephemeral streams; thus, many of the intermittent streams are ephemeral drainages that do not support riparian vegetation. Major perennial streams located all or in part within the allotment include: Little Smith, Beaver, and Castle Creek and the East Fork, West Fork and Red Canyon.

The NHD identifies 37 springs/seeps that occur within the allotment. They are all located in the northern four pastures, support small areas of riparian-wetland vegetation, and provide the contributing waters for the streams.

Previous Assessment Summary
The Castlehead-Lambert Rangeland Health Assessment dated June 2003 primarily

[4] Perennial: Contains water throughout the year, except for infrequent periods of severe drought.
Intermittent: Contains water for only part of the year, but more than just after rainstorms and at snowmelt.
Ephemeral: A stream or stretch of stream that flows in normal water years only in direct response to precipitation and whose channel is above the water table at all times.

discussed the results of Proper Functioning Condition (PFC)[5] assessments that were conducted on streams, springs/seeps, and their associated riparian-wetland areas. The results of the assessment indicated that the majority of the headwater springs and streams are functioning-at-risk (FAR)[6].

Typically for the reaches of stream that were not in proper functioning condition, there was inadequate riparian-wetland vegetation present to protect streambanks and dissipate energy during high flows, and plant communities were often not comprised of deep-rooted bank stabilizing hydric species.

In general, the springs that are not fenced to exclude livestock were not meeting the standard due to a high percentage of bare soil, heavy utilization of riparian-wetland vegetation, and shearing of wetland soils.

Table RIPN-1: Total Miles of Perennial and Intermittent Stream, and Number of Springs within Pasture

Pasture #	Pasture Name	Perennial Miles	Intermittent Miles	# Springs
1A & 1B	Castlehead & Mountain	18.5	24.0	26
2	Carter Springs	0.25	39.75	5
3	Red Basin	1.1	34.7	1
4	Lambert Table	0	16.75	0
5	Horse pasture	0.4	9.0	5

Current Assessment

Pasture 1A & 1B – Castlehead & Mountain

According to the NHD, pastures 1A and 1B of the allotment contains approximately 18.5 miles of perennial streams, 24 miles of intermittent streams, and 26 spring-seeps. More than fifteen miles of the streams have been assessed using the PFC protocol; 5.4 miles are in proper functioning condition and about 10 miles are functional-at-risk (Tables RIPN 2, 3 and 4, Map 5). Fifteen of the springs have been assessed; six are non-functional, one is functional-at-risk, and eight are properly functioning. In addition, four

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

[6] PFC indicates a riparian-wetland area has adequate vegetation, landform, or large woody debris present to dissipate stream energy, filter sediment, aid ground water recharge,aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics. FAR AND NF indicate that the riparian-wetland area does not have sufficient vegetation, landform, or large woody debris to dissipate stream energy, filter sediment,
aid ground water recharge, aid in floodplain development, stabilize streambanks, and/or maintain channel characteristics.

reaches of stream have been monitored using the Multiple Indicator Monitoring (MIM)[7] method (Tables RIPN 6 and 7), and four greenline transects[8] were established in 2004 (Table RIPN-5).

The reaches of stream that are accessible and the spring/seeps that are not protected from livestock are not functioning properly, in terms of the resiliency that allows a riparian area to hold together during a high-flow event, which then provides desired values (i.e., floodplain development, sediment filtration, and wildlife habitat) to the area. Some of the specific issues identified include a lack of bank stabilizing species of riparian-wetland vegetation, deeply incised stream channels, a high percentage of bare ground, and a general loss of soil.

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

Greenline transects established on the EF and WF of Red Canyon, Castle, and Little Smith Creeks documented bank stability and vegetation information. The values for the portions of the stream reach that were unstable range from 28 to 55 percent.

Table RIPN-2: Castlehead-Lambert Streams Assessed and their Functioning Condition

Stream Name	Pasture	Segment ID	Reach Length (miles)	Condition
Beaver Creek	2	BEA001	0.44	FAR
Beaver Creek	2	BEA002	0.91	FAR
Beaver Creek	2	BEA003	0.99	FAR
Beaver Creek	2	BEA004	1.12	FAR
Carter Creek	2	CAR003	0.65	FAR
Carter Creek	2	CAR001	0.94	FAR
Castle Creek	1A & 1B	CST006	0.28	FAR
Castle Creek	1A & 1B	CST007	0.89	PFC
Castle Creek, Deep Creek Trib	1A & 1B	CST005	0.64	FAR
Castle Creek, Deep Creek Trib	1A & 1B	CST004	0.00	FAR
East Fork Red Canyon Creek	1A & 1B	ERC001	1.10	FAR
East Fork Red Canyon Creek	1A & 1B	ERC002	0.86	PFC
East Fork Red Canyon Creek	1A & 1B	ERC003	0.75	FAR

[7] MIM sites are based in Interagency Technical Reference 1737-23, *Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation*

[8] Greenline transects are based on BLM Technical Reference 1737-8, *Greenline riparian-wetland monitoring : Riparian area management*

Stream Name	Pasture	Segment ID	Reach Length (miles)	Condition
East Fork Red Canyon Creek	1A & 1B	ERC004	0.93	FAR
East Fork Red Canyon Creek	1A & 1B	ERC005	1.15	FAR
East Fork Red Canyon Creek	1A & 1B	ERC006	0.68	FAR
Little Smith Creek	1A & 1B	LSM002	0.64	FAR
Moonshine Spring Creek	1A & 1B	MOO001	0.76	FAR
Red Canyon Creek	3	RED001	0.73	PFC
Red Canyon Creek	3	RED002	1.30	PFC
Red Canyon Creek	3	RED003	0.96	PFC
Red Canyon Creek	3	RED004	1.18	PFC
Red Canyon Creek	3	RED005	1.10	FAR
West Fork Red Canyon Creek	1A & 1B	WRC001	1.27	PFC
West Fork Red Canyon Creek	1A & 1B	WRC002	1.18	FAR
West Fork Red Canyon Creek	1A & 1B	WRC003	0.34	PFC
West Fork Red Canyon Creek	1A & 1B	WRC003	0.63	PFC
West Fork Red Canyon Creek	1A & 1B	WRC004	0.57	PFC
West Fork Red Canyon Creek	1A & 1B	WRC005	0.81	PFC
West Fork Red Canyon Creek	1A & 1B	WRC006	0.76	FAR

Table RIPN-3: Castlehead-Lambert Springs Assessed and their Functioning Condition

Spring Name	Pasture	Developed	Condition 1	Date 1	Condition 2	Date 2	Acres
Wonder Spring	1A & 1B	Y	FAR	2002	PFC	2009	1
Beaver Creek Springs	1A & 1B	N			PFC	2009	3
Boggy Spring	1A & 1B	N	NF	2002	PFC	2009	1
Buckskin Spring	1A & 1B	N			PFC	2009	1
Carter Spring	2	N	PFC/FAR	2002	FAR	2009	1
Castlehead Spring	1A & 1B	Y			PFC	2009	2
Springs	2	N			FAR	2009	1
East Spring	1A & 1B	N	NF	2002	PFC	2009	1
Moonshine Spring	1A & 1B	N			PFC	2009	3
Rock Spring	1A & 1B	Y			PFC	2009	1
Unnamed Spring	1A & 1B	N	FAR	2002			1
Unnamed Spring (North of Carter Spring)	2	Y	PFC	2002			0.5
Craig Camp Spring	1A & 1B	N	NF	2002			<0.25
Unnamed Spring	1A & 1B	Y	NF	2002			<0.25
Unnamed Spring	1A & 1B	N	NF	2002			1
Unnamed Spring	2	N	FAR	2002			0.25
Unnamed Spring	1A & 1B	N	NF	2002			<0.25
Unnamed Spring	1A & 1B	N	NF	2002			
Rattlesnake Spring	5	Y	FAR	2002	PFC	2009	1
Craig Springs	5	Y	FAR	2002	PFC	2009	1
Unnamed Spring	5	Y	FAR	2002			<0.25
Roaring Spring	5	N	NF	2002			0.25

Table RIPN-4: Riparian area indicators and stream reach condition for pasture 1 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators	**BLM Stream Segment**													
	EF Red Cny 001	EF Red Cny 002	EF Red Cny 003	EF Red Cny 004	EF Red Cny 005	EF Red Cny 006	WF Red Cny 001	WF Red Cny 002	WF Red Cny 006	Little Smith 002	Moonshine Spring 001	Castle 005	Castle 006	Castle 007
Diverse age class/ structure of hydric vegetation (6)	y/n	y	y/n	n	y/n	n	y	y/n	n	n	y	y/n	n	y
Diverse composition of hydric vegetation (7)	y/n	y	y/n	n	y/n	n	y/n	y/n	n	n	y/n	y/n	n	y
vegetation reflects maintenance of soil moisture (8)	y	y	y	y	y	y	y	Y	y	y	y	y	y	y
plant community comprised of bank stabilizing species (9)	y/n	y/n	y	n	y/n	n	y/n	N	n	n	y/n	y/n	n	y
hydric vegetation exhibits height vigor (10)	n	y	y	n	n	n	y/n	Y	n	n	y	y	y	y
adequate hydric vegetation cover present to protect banks and dissipate energy (11)	n	y	y/n	n	n	n	y/n	N	n	n	n	n	n	y
adequate large woody material (12)	na	na	na	na	na	na	na	na	na	na	na	na	na	na
point bars revegetating with hydric species	y	y	y	n	n	n	y	Y	n	n	n	y	n	y

Riparian-Wetland Indicators	BLM Stream Segment													
	EF Red Cny 001	EF Red Cny 002	EF Red Cny 003	EF Red Cny 004	EF Red Cny 005	EF Red Cny 006	WF Red Cny 001	WF Red Cny 002	WF Red Cny 006	Little Smith 002	Moonshine Spring 001	Castle 005	Castle 006	Castle 007
(14)														
noxious weeds are not increasing	y	y	y	y	y	y	y	y	y	y	y	y	y	y
Functioning Condition	FAR	PFC	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR

y = yes; n = no; y/n = both- yes for some portions and no for others

Table RIPN-5: Castlehead-Lambert Greenline Information

Stream	Pasture	Date	% Veg/ Stable	% Veg/ Unstable	% Unveg/ Stable	% UnVeg/ Unstable	% BARE
RED CANYON	3	6/16/2004	93	3	2	2	1
EF RED CANYON	1	6/30/2004	34	36	21	10	7
WF RED CANYON	1	6/30/2004	48	10	25	18	14
CARTER CREEK	2	6/29/2004	28	38	13	21	21
BEAVER CREEK	2	6/29/2004	36	47	13	4	0
CASTLE CREEK	1	6/30/2004	36	42	16	7	11
LITTLE SMITH CREEK	1	6/30/2004	38	32	7	23	29

Veg = vegetation communities counted along the greenline
Unveg = no vegetation community was present to count; if stability was determined, rock or large woody debris was present

Tables RIPN-6: Multiple Indicator Monitoring (MIM) Capability Groups

Greenline Ecological Status Rating

Summary Value	Condition Rating
0-15	Very Early
16-40	Early
41-60	Mid
61-85	Late
85+	PNC

Vegetation-Erosion Resistance Status Rating

Summary Value	Condition Rating
0-2	Very Low
3-4	Low
5-6	Moderate
7-8	High
9-10	Very High

Site Wetland Status Rating

Summary Value	Condition Rating
0-15	Very Poor
16-40	Poor
41-60	Fair
61-85	Good
85+	Very Good

Tables RIPN-7: Castlehead-Lambert Multiple Indicator Monitoring (MIM) Information

Stream Reach	Greenline Ecological Status Summary Value/Rating	Vegetation-Erosion Resistance Summary Value/Rating	Site Wetland Status Summary Value/Rating
Castle Creek	67 (Good)	6.88 (Moderate)	88 (PNC)
EF Red Canyon	64 (Good)	6.42 (Moderate)	76 (Late)
WF Red Canyon	10 (Very Poor)	4.27 (Low)	2 (Very Early)
Little Smith Creek	45 (Fair)	5.0 (Moderate)	37 (Early)

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

Pasture 2 – Carter Spring

According to the NHD, pasture 2 of the allotment contains approximately 0.25 miles of perennial streams (Beaver Creek), 39.75 miles of intermittent/ephemeral streams, and five spring/seeps. More than five miles of Beaver and Carter Creeks have been assessed using the PFC protocol, and all are functional-at-risk (Map 5). All five of the springs have been assessed; three are functional-at-risk, and two are properly functioning.

The reaches of stream that support riparian-wetland vegetation and the spring/seeps that are not protected from livestock are not functioning properly in terms of the resiliency that allow a riparian area to hold together during a high-flow event, which then allows the area to provide desired values (i.e., floodplain development, filter sediment, and wildlife habitat). Some of the specific issues identified include a lack of riparian-

wetland vegetation that stabilize the banks, heavy browse on woody species, and a high percentage of bare ground.

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

Table RIPN-8: Riparian area indicators and stream reach condition for pasture 2 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators:	**BLM Stream Segment**							
	Beaver 001	Beaver 002	Beaver 003	Beaver 004	Beaver 005	Carter 001	Carter 002	Carter 003
Diverse age class/ structure of hydric vegetation (6)	y	y	n	N	n	n	y/n	y/n
Diverse composition of hydric vegetation (7)	n	y/n	n	N	y	n	n	y/n
vegetation reflects maintenance of soil moisture (8)	n	n	n	N	n	n	n	n
plant community comprised of bank stabilizing species (9)	n	n	n	N	n	n	n	n
hydric vegetation exhibits hight vigor (10)	y/n	y	y/n	N	y	y/n	y/n	y/n
adequate hydric vegetation cover present to protect banks and dissipate	n	n	n	n	n	n	n	n

Riparian-Wetland Indicators:	BLM Stream Segment							
	Beaver 001	Beaver 002	Beaver 003	Beaver 004	Beaver 005	Carter 001	Carter 002	Carter 003
energy (11)								
adequate large woody material (12)	na	na	na	Na	na	na	na	na
point bars revegetating with hydric species (14)	n	n	n	N	y	n	n	n
noxious weeds are not increasing	y	y	y	Y	y	y	y	y
Functioning Condition	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR

y = yes; n = no; y/n = both- yes for some portions and no for others

Pasture 3 – Red Basin

According to the NHD, pasture 3 of the allotment contains approximately 1.1 miles of perennial streams, 34.7 miles of intermittent/ephemeral streams, and one spring/seep. Five reaches of Red Basin have been assessed using the PFC protocol: 1.15 miles are functional-at-risk and 4.17 miles are functioning properly (Map 5). The lower three reaches traverse the boundary of the allotment/ pasture and fall within an area that is technically excluded from livestock. There is evidence that livestock occasionally access these streams, and they were included here for reference. More than eight miles of Red Canyon Creek that traverse the pasture were not assessed but are likely functioning properly because they are inaccessible to livestock. Rattlesnake Spring was assessed functional-at-risk in 2002 and properly functioning in 2009.

The reaches of stream and the spring/seep that support riparian-wetland vegetation and that are not functioning properly in terms of the resiliency that allow a riparian area to hold together during a high-flow event are those that are accessible to livestock. Some of the specific issues identified include a lack of riparian-wetland vegetation that stabilizes the banks and upland species in what would be the riparian zone. Much of the stream channel and floodplain of Red Canyon Creek is well-armored with rock. The bank and channel stability of this stream (about 3 miles) is a function of rock armoring rather than that of riparian vegetation.

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

Table RIPN-9: Riparian area indicators and stream reach condition for pasture 3 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators	**BLM Stream Segment**	
	Red Cny 005	Red Basin 001
Diverse age class/ structure of hydric vegetation (6)	y/n	y
Diverse composition of hydric vegetation (7)	y/n	y
vegetation reflects maintenance of soil moisture (8)	Y	y/n
plant community comprised of bank stabilizing species (9)	y/n	y
hydric vegetation exhibits hight vigor (10)	y/n	y
adequate hydric vegetation cover present to protect banks and dissipate energy (11)	N	y
adequate large woody material (12)	Na	na
point bars revegetating with hydric species (14)	Y	y
noxious weeds are not increasing	Y	y
Functioning Condition	FAR	PFC

y = yes; n = no; y/n = both- yes for some portions and no for others

Pasture 4 – Lambert Table

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

Pasture 5 - Horse

According to the NHD, pasture 5 of the allotment contains approximately 0.4 miles of perennial stream, nine miles of intermittent/ephemeral stream and five springs.

The streams in pasture 5 support intermittent/ ephemeral flows and very little riparian vegetation, and thus have not been assessed using the PFC protocol. The East Fork of Red Canyon flows along the border between pasture 1 and 5 and was discussed under pasture 1 above. Three of the five springs have been assessed using the PFC protocol: two are functional-at-risk and one is non-functioning. One of the functional-at-risk springs was re-assessed and determined to be functioning properly.

Evaluation of Standard 2

Evaluation Finding – allotment/watershed is:
__ Meeting the Standard
__ Not meeting the Standard, but making significant progress towards meeting
_X_ Not meeting the Standard

RMP Objectives/ Desired Conditions:
Maintain or improve riparian-wetland areas to attain proper functioning and satisfactory conditions. Riparian-wetland areas include streams, springs, seeps, and wetlands.

Rationale for Evaluation Finding

Based on the National Hydrologic Dataset (NHD), riparian and water resources within the allotment include approximately 22 miles of perennial stream, more than 100 miles of intermittent and ephemeral streams, and more than 30 springs. The major drainages include: EF and WF Red Canyon, Red Canyon, Little Smith Creek, Beaver Creek, Carter Creek, Moonshine Spring Creek, and Castle Creek.

Approximately 24.5 miles of perennial and intermittent stream have been assessed: 15.5 miles were assessed functioning-at-risk (FAR) and approximately nine miles were assessed to be in proper functioning condition (PFC).

Sixteen springs were assessed in 2003: eight were non-functioning, seven were FAR, and one was PFC. Twelve were assessed in 2009: two were FAR and 10 were PFC. Five of the previously assessed springs were revisited in 2009 and the short-term indicators (stubble height, bank alteration, and woody browse) show an improvement.

Greenline information available from 2004 indicate bank stability on eight reaches of stream have values ranging between 41 and 95 percent stable.

Four Multiple Indicator Monitoring (MIM) sites were established in 2009 on perennial reaches of the EF and WF of Red Canyon, Castle Creek, and Little Smith Creek. The Greenline Ecological Status ratings range from Very Poor to Good; the Vegetation Erosion Resistance index ranges from Low to Moderate; and the Site Wetland Status ranges from Very Early to Potential Natural Community.

Typically, for the reaches of stream that are not in proper functioning condition, there is inadequate riparian-wetland vegetation present to protect streambanks and dissipate energy during high flows, and plant communities are often not comprised of deep-rooted bank-stabilizing hydric species. Additional specific issues identified include deeply incised stream channels, a high percent of bare ground, heavy browse on woody species where present, and a general loss of soil.

In general, the springs that are not fenced to exclude livestock are not meeting the

standard, due to a high percentage of bare soil, heavy utilization of riparian-wetland vegetation, and shearing of wetland soils. All of the aforementioned issues with streams and spring/seeps indicate that this allotment is not meeting the standard for riparian areas and wetlands.

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Standard 3 – Stream Channel/Floodplain __ Standard Doesn't Apply

Stream channels and flood plains are properly functioning relative to the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity) and climate to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include but are not limited to:

1. Stream channels and floodplains dissipate energy of high water flows and transport sediment. Soils support appropriate riparian-wetland species, allowing water movement, sediment filtration, and water storage. Stream channels are not entrenching.
2. Stream width/depth ratio, gradient, sinuosity, and pool, riffle and run frequency are appropriate for the valley bottom type, geology, hydrology, and soils.
3. Streams have access to their floodplains and sediment deposition is evident.
4. There is little evidence of excessive soil compaction on the floodplain due to human activities.
5. Streambanks are within an appropriate range of stability according to site potential.
6. Noxious weeds are not increasing.

Rangeland Health Assessment

Overview
See discussion under Standard 2 above.

Previous Assessment Summary
See discussion under Standard 2 above.

Current Assessment

Pasture 1 - Castlehead
More than fifteen miles of the streams in pasture 1 have been assessed using the PFC protocol; 5.4 miles are in proper functioning condition and about 10 miles are functional-at-risk (Table RIPN-10, Map 5). In addition, four reaches of stream have been monitored using the MIM method.

The major streams assessed include reaches on the East and West Fork of Red Canyon, Little Smith Creek, Moonshine Spring Creek, and Castle Creek. The stream reaches that are accessible to livestock are functional-at-risk, primarily due to the lack of bank-stabilizing riparian species necessary for the maintenance of stable stream channels and floodplains. The majority of streams in pasture 1 are dependent on

riparian vegetation for bank stability. Other issues identified include over-widening of stream channels, deeply incised channels, laterally and vertically (presence of headcuts) unstable channels, shrinking riparian areas, and upland species appearing in the riparian areas.

Table RIPN-10: Stream channel and floodplain indicators and stream reach condition for pasture 1 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators	**BLM Stream Segment**													
	EF Red Cny 001	EF Red Cny 002	EF Red Cny 003	EF Red Cny 004	EF Red Cny 005	EF Red Cny 006	WF Red Cny 001	WF Red Cny 002	WF Red Cny 006	Little Smith 002	Moonshine Spring 001	Castle 005	Castle 006	Castle 007
floodplain inundated frequently (1)	n	y/n	n	n	y	y/n	Y	y/n	y	y/n	y	y/n	n	y/n
beaver dams are active and stable (2)	na	na	na	na	na	na	Na	na	na	na	na	na	na	na
sinuosity, w/d ratio, gradient are in balance with the landscape ((3)	n	y	n	n	y/n	n	y/n	n	n	n	n	n	n	y
riparian area is widening or has achieved potential extent (4)	n	y	n	n	n	n	y/n	n	n	n	n	n	n	y
upland watershed not contributing to riparian degradation (5)	y	y	y	y	y	y	Y	y	y	y	y	y	y	y
floodplain and channel characteristics dissipate energy (13)	n	y	n	n	n	n	Y	n	n	n	n	n	n	y
lateral stream	y/n	y	y	y	y	y/n	Y	y	y	n	y	y	y	y

Riparian-Wetland Indicators	BLM Stream Segment													
	EF Red Cny 001	EF Red Cny 002	EF Red Cny 003	EF Red Cny 004	EF Red Cny 005	EF Red Cny 006	WF Red Cny 001	WF Red Cny 002	WF Red Cny 006	Little Smith 002	Moonshine Spring 001	Castle 005	Castle 006	Castle 007
movement associated with natural sinuosity (15)														
system is vertically stable (16)	n	y	y	y	y	y	Y	y	y	n	y	y	n	n
no excessive erosion or deposition (17)	n	y	y	y	y	y	Y	y	y	y/n	y	y	n	y
Functioning Condition	FAR	PFC	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR

y = yes; n = no; y/n = both- yes for some portions and no for others

Pasture 2 – Carter Spring

More than five miles of Beaver and Carter Creeks in pasture 2 have been assessed using the PFC protocol, and all are functional-at-risk (Table RIPN-11, Map 5). Similar to most of the accessible streams in the allotment, the reaches of Beaver and Carter Creeks that are accessible to livestock lack bank stabilizing riparian plant species have over-widened stream channels and an excess of sediment deposits.

Table RIPN-11: Stream channel and floodplain indicators and stream reach condition for pasture 2 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators:	**BLM Stream Segment**							
	Beaver 001	Beaver 002	Beaver 003	Beaver 004	Beaver 005	Carter 001	Carter 002	Carter 003
floodplain indundated frequently (1)	y/n	y/n	y/n	y/n	y/n	y	y	y
beaver dams are active and stable (2)	na	na	na	na	na	na	na	na
sinuosity, w/d ratio, gradient are in balance with the landscape (3)	y/n	n	n	n	n	n	n	y
riparian area is widening or has achieved potential extent (4)	n	n	n	n	n	n	n	n
upland watershed not contributing to riparian degradation (5)	y	y	y	y	y	y	y	y
floodplain and channel characteristics dissipate energy (13)	n	n	n	n	n	n	n	y
lateral stream movement associated with natural sinuosity (15)	y	y/n	n	y	y	y	y	y
system is vertically stable (16)	y	y/n	n	n	y	y	n	y
no excessive erosion or deposition (17)	n	n	n	n	n	n	y	y
Functioning Condition	FAR	FAR	FAR	FAR	FAR	FAR	FAR	FAR

Pasture 3 – Red Basin
Reaches on the East Fork and West Fork of Red Canyon and Red Canyon (2.4 miles) in pasture 3 have been assessed using the PFC protocol: 1.23 miles are functional-at-risk and 1.16 miles are functioning properly (Table RIPN-12, Map 5). More than eight miles of Red Basin Creek that traverse the pasture were not assessed but are likely functioning properly because they are inaccessible to livestock. The reach of Red Canyon Creek that is not functioning properly is laterally unstable (wide and shallow channel), the riparian area is shrinking, and there is a lack of bank stabilizing riparian plant species (especially willows (*Salix spp.*)).

Table RIPN-12: Stream channel and floodplain indicators and stream reach condition for pasture 3 of the Castlehead-Lambert allotment

Riparian-Wetland Indicators:	**BLM Stream Segment**	
	Red Cny 005	Red Basin 001
floodplain inundated frequently (1)	Y	y
beaver dams are active and stable (2)	Na	na
sinuosity, w/d ratio, gradient are in balance with the landscape ((3)	y/n	y
riparian area is widening or has achieved potential extent (4)	N	y
upland watershed not contributing to riparian degradation (5)	Y	y
floodplain and channel characteristics dissipate energy (13)	y/n	y
lateral stream movement associated with natural sinuosity (15)	N	y
system is vertically stable (16)	Y	y
no excessive erosion or deposition (17)	Y	y
Functioning Condition	FAR	PFC

Pasture 4 – Lambert Table
See discussion under Standard 2 above.

Pasture 5 - Horse
See discussion under Standard 2 above.

Evaluation of Standard 3

Evaluation Finding – allotment/watershed is:
__ Meeting the Standard
__ Not meeting the Standard, but making significant progress towards meeting
_X_ Not meeting the Standard

RMP Objectives/ Desired Conditions:
See information under Standard 2 above.

Rationale for Evaluation Finding

See information under Standard 2 above.

Information Sources

See information under Standard 2 above.

Standard 4 – Native Plant Communities __ Standard Doesn't Apply

Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include but are not limited to:

1. Native plant communities (flora and microbiotic crusts) are maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant species.
2. The diversity of native species is maintained.
3. Plant vigor (total plant production, seed and seedstalk production, cover, etc.) is adequate to enable reproduction and recruitment of plants when favorable climatic events occur.
4. Noxious weeds are not increasing.

Owyhee Resource Management Plan
The one vegetation management objective for the ORMP is to improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas. Livestock management actions to meet this objective related to rangeland health standard 4 include:

Management action 1: Implement grazing practices that during and at the end of the grazing season provide adequate amounts of ground cover (determined on an ecological site basis) to support proper infiltration, maintain soil moisture, stabilize soils, and maintain site productivity.

Management action 2: Implement grazing practices that improve or maintain native rangeland species to attain composition, density, foliar cover and vigor appropriate to site potential.

Management action 7: Implement grazing practices designed to meet Idaho Standards for Rangeland Health and conform to the Guidelines for Livestock Grazing Management.

Guidelines applicable to Standard 4 include:
1) Use grazing management practices and/or facilities to maintain or promote significant progress toward adequate amounts of ground cover (determined on an ecological site basis) to support infiltration, maintain soil moisture storage, and stabilize soils;
3) Use grazing management practices and/or facilities to maintain of promote soil conditions that support water infiltration, plant vigor, and permeability rates and minimize soil compaction appropriate to site potential;
4) Implement grazing management practices that provide periodic rest or deferment during critical growth stages to allow sufficient regrowth to achieve and maintain healthy, properly functioning conditions, including good plant vigor and adequate cover appropriate to site potential; 8) Apply grazing management practices that maintain or promote the interaction of the hydrologic cycle, nutrient cycle, and energy flow that will support the appropriate types and amounts of soil organisms, plants, and animals appropriate to soil type, climate, and landform;
9) Apply grazing management practices to maintain adequate plant vigor for seed production, seed dispersal, and seedling survival of desired species relative to soil type, climate, and landform;
12) Apply grazing management practices and/or facilities that maintain or promote the physical and biological conditions necessary to sustain native plant populations and wildlife habitats in native plant communities.

Rangeland Health Assessment

Where applicable, available data used to develop this assessment include Rangeland Health Field Assessments (RHFA), upland trend data, the Noxious Weed GIS layer, and 2010 Emergency Stabilization & Rehabilitation (ESR) Report.

The number of RHFAs by pasture is displayed at the beginning of each pasture section along with the associated Ecological Site and approximate area burned by the 2007 Crutcher Fire. The evaluations were conducted in accordance with the procedure described in BLM-Technical Reference 1734-6, “Interpreting Indicators of Rangeland Health - Version 3” (USDI-BLM 2000). This procedure is a comparison of 17 indicators of rangeland health observed for a field assessment site to an Ecological Site Description or a reference site that displays a natural range of the expected physical and vegetative characteristics. The analysis of the biotic integrity attribute considers nine indicators: soil surface resistance to erosion, soil surface loss or degradation, compaction layer, functional/structural groups, plant mortality/decadence, litter amount, annual production, invasive plants, and reproductive capacity of perennial plants. The interpretation process is the critical link between observations of indicators and determining the degree of departure from what is expected for the site at potential. RHFA monitoring sheets, photos, functional group descriptions, cover class percentages, and site documentation for species abundance and dominant life forms were utilized in an interdisciplinary team setting to aid in the interpretation and summary of attribute ratings. Changes from previous decisions made in 2001 were applied where necessary, based on the array of updated and available information. In this scenario, ecological site descriptions specific to each monitoring site location were used to

provide for interpretation of departure from reference conditions. The compilation of recorded departures of these indicators and the associated biotic attribute rating for the Castlehead-Lambert allotment is displayed in Appendix D: Rangeland Health Indicators & Attribute Ratings.

A “preponderance of evidence” approach was used to select the appropriate departure category for each attribute. The decision was based on where the majority of indicators for each attribute fell and a rating based on professional judgment that considered whether an indicator was particularly important for the site. Water flow patterns, reduced soil surface loss or degradation, and resistance to erosion indicators were consequently given more weight during the determination of overall ratings. Such an approach therefore excluded the use of a numerical indicator tally and heavily relied on a summary of all available information.

Trend data were collected at four sites - one site within each pasture, except for pastures 5 and 6. Details of trend are provided within the Upland Trend Data section by pasture.

Summarized trend data with the identification of short term changes, which are statistically significant ($p<0.1$), are presented in Appendix C: Trend.

Utilization data (Appendix G) for this allotment focused on bluebunch wheatgrass and Idaho fescue with data available from 1990 to 1997 and 2010 to 2011. For 2010 utilization data is generally available for pastures 2, 3, and 4. Pastures 1, 3, 4, 5 and 6 have utilization data for 2011. Data reported in 2010 and 2011 have been less than the maximum allowable level of 50 percent, rarely reaching into 40 percent.

Pasture 1 Castlehead and Pasture 6 Between-the-Canyons

Table VEG-1: Rangeland Health Field Assessment for pastures 1 and 6

Pasture 1 & 6: Rangeland Health Assessments (RHAs)			
Approximately 23% of pasture 1 and 83% of pasture 6 burned in the 2007 Crutcher fire.			
Unburned		**Burned (2007 fire)**	
#	**Ecological Site**	**#**	**Ecological Site**
3	Loamy 13-16” ppt	1	Loamy 13-16” ppt
1	Mahogany savanna	1	Mahogany savanna
1	Loamy 10-16” ppt	**2**	**Total Burned**
5	**Total Unburned**		

Common to all RHFA sites

Plant vigor has a none-to-slight degree of departure from reference condition in six of seven sites. The exception lies within one unburned juniper-dominated site where plant vigor is heavily dampened by juniper encroachment and displays further departures in biotic indicators beyond all other sites. Juniper is present throughout the pasture, with

occasional presence at burned sites and juniper encroachment and recruitment evident at all five unburned sites. The site is rated as a moderate departure from potential for the functional-structural group, due to increasing juniper invasion that has reduced the understory species that provide competition for nutrients. Annual weeds such as cheatgrass *(Bromus tectorum)* and mustards, as well as short-lived perennial grasses such as bulbous bluegrass (*Poa bulbosa*), occur rarely too occasionally within the pasture with, at the most, a minor (1 to 5 percent) presence. Annual weeds were more likely to have a moderate invasive plant indicator rating when located within disturbed areas such as rights-of-way and areas of livestock concentration and where juniper is replacing the potential bunchgrass/shrub community in Mahogany Savanna and Loamy ecological sites.

Overall biotic integrity of burned sites within pasture 1 has a slight-to-moderate departure from ecological potential, based mainly on functional/structural groups and invasive annual weeds.

Unburned Area
Relative to the Mahogany Savanna and Loamy ecological site descriptions, all sites that evaded the 2007 fire document juniper dominance in excess of site potential, as reflected in a moderate departure from potential. In Loamy sites, juniper has replaced mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*), low sagebrush (*Artemisia arbuscula*), and perennial bunchgrasses, as a result of competition for nutrients, sunlight and soil moisture. All RHFAs within juniper-dominated sites reflect an increase in shallow-rooted perennial grasses, primarily Sandberg bluegrass (*Sandberg bluegrass*) and squirreltail (*Elymus elymoides*) and a decrease in deep-rooted perennial bunchgrasses,bluebunch wheatgrass (*Pseudoroegneria spicata)*, Idaho fescue (*Festuca idahoensis)*, needlegrass (*Achnatherum spp.* The shrub component (mountain mahogany (*Cercocarpus ledifolius*), mountain big sagebrush (*Artemisia tridentata* ssp. t*ridentata*), bitterbrush (*Purshia tridentata*), etc.) in the Mahogany Savanna site was measured at 2 to 5 percent, which is a marked decrease from the 40-to-100 percent potential for this ecological site. In both the Loamy and Mahogany Savanna sites, a diversity of forbs, grasses, and shrubs appear to be present, yet the presence of shallow-rooted grasses is higher than expected, and presence of deep-rooted bunchgrasses is lower, creating an overall imbalance in the expected percentages relative to potential.

Given the severity of juniper (an invasive species) presence and functional/structural group imbalance, unburned areas in pasture 1 have an overall moderate departure for biotic integrity.

Burned Area
RHFAs within the 2007 wildfire perimeter more closely resemble site potential, aside from the lacking shrub component. Shallow-rooted perennial grasses (i.e. Sandberg bluegrass), deep-rooted perennial grasses (bluebunch wheatgrass, Idaho fescue, needlegrass), and native forbs all show minimal, if any, departure from potential at both sites. Mountain big sagebrush, Wood's rose (*Rosa woodsii*), rabbitbrush

(*Chrysothamnus & Ericameria spp.*), bitterbrush, current (*Ribes spp.*) and ceanothus (*Ceanothus velutinus*) presence is generally lacking at the Loamy ecological site, with minimal recruitment observed. The Mahogany Savanna site shrub component is at the site potential composition, yet lacks the balance between species. This previously thick juniper site is now dominated by ceanothus; mountain mahogany and snowberry (*Symphoricarpos oreophilus*) are few. Invasive plants are localized in disturbed areas such as roads and severely burned areas. As a result of the 2007 fire, juniper has been greatly reduced and is only present in trace amounts (less than 2 percent composition). Overall rating for burned sites within pasture 1 is a slight-to-moderate departure, weighing mainly on the lack of a shrub component.

Noxious Weeds

Within pasture 1, Canada thistle (*Cirsium arvense*) and whitetop (*Cardaria draba*) are the only known noxious weeds. Canada thistle occurs at one site near Carter Springs, very close to the whitetop infestation. After the 2007 Crutcher fire, and as a result of the BAR (Burned Area Rehabilitation), chemical treatment of the whitetop site occurred in 2008 and 2009, resulting in moderate success with reductions from 50 to 90 percent (USDI-BLM 2010). Treatment was also performed in 2010; success of this treatment is still to be determined. All sites will continue to have treatment as a portion of the Boise District weed program.

ESR Report

Three years of monitoring were performed after the 2007 Crutcher fire as an Emergency Stabilization and Rehabilitation project (USDI-BLM 2010). Sites were selected within adjacent unburned areas (control) and within the burned area. Monitoring methods included photo points, density, gap intercept, and line-point intercept for 2008, 2009, and 2010. Final data indicate natural recovery of common or abundant native perennial forbs and grasses is good, with many vigorous plants in various stages of seed production. In areas where the fire burned more in a mosaic/finger pattern, or where the vegetation was subject to moderate fire severity, the adjacent shrubs remain as a seed source for reestablishment and progress is being made toward potential. In areas that burned more completely or hot, an absence of shrub canopy and structure is present. The lack of seed source for these large contiguous burned areas will delay natural reestablishment of the shrub component. Overall recovery appears to be on a scale of slow to moderate, which varies by degree of juniper encroachment and fire severity.

Table VEG-2: Upland Trend Data for pastures 1 and 6

Pasture 1 & 6: Upland Trend *One Trend Site located within the 2007 Crutcher Fire in Pasture 1.*						
Years of Data Collection	**1986**	**1988**	**1995**	**2001**	**2007**	**2011**
Long-Term Trend	X	X	X	X	X	X
* low sagebrush			X	X	X	X
Short-Term Trend				X	X	X

The Loamy ecological site of this trend point identifies the dominant shrub component as mountain big sagebrush and dominant bunchgrasses as bluebunch wheatgrass and Idaho fescue, with Sandberg bluegrass and squirreltail a minor component. However, in terms of the shrub component, this is contrary to long-term trend data with a pre-fire vegetation weighted to low sagebrush. One reason for this discrepancy is that Ecological Site Descriptions are generally broad overviews with inclusions that are not easily teased out without ground-truthing. A static long-term trend is normal for frequency of bitterbrush (Figure VEG-2) and perennial grasses (bluebunch, Idaho fescue, Sandberg, squirreltail) (Figure VEG-1) within the pasture. Bluebunch wheatgrass has an increase in frequency over the short-term while all other perennial bunchgrasses and low sagebrush have a decrease. Tree and shrub density data show a sharp decline in low sagebrush after the 2007 fire. Bulbous bluegrass had a general flush immediately post-wildfire, contributing to a short-term increase within the burned area. Bulbous bluegrass data were not available for the long-term.

Figure VEG-1: Frequency of native perennial grasses at pasture 1 trend site

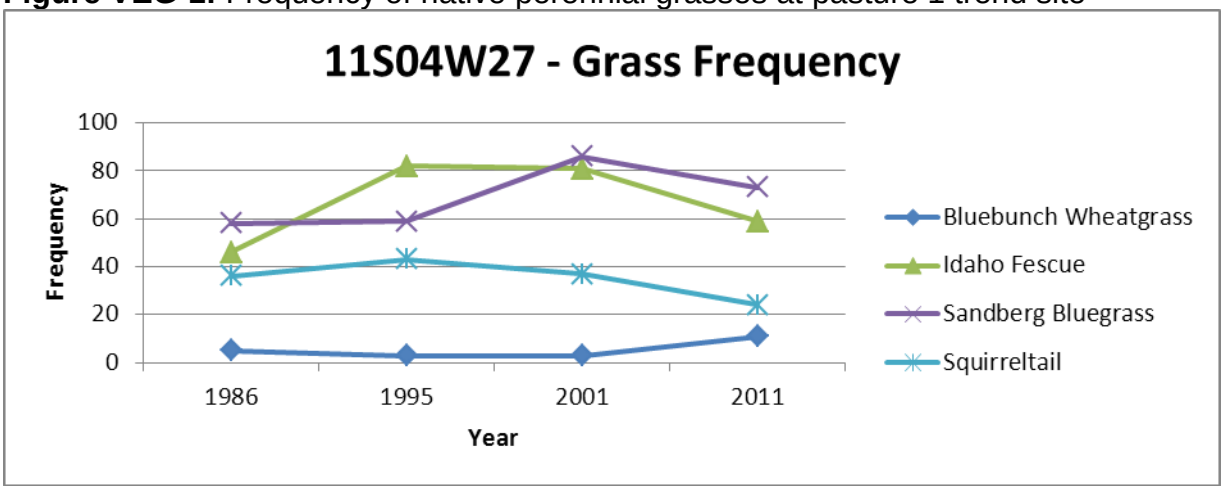
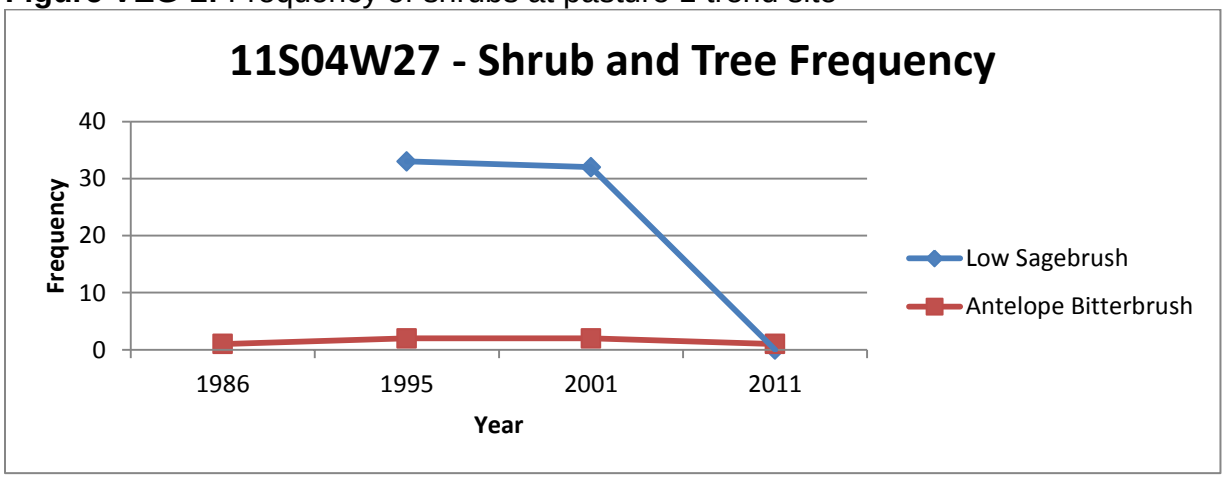


Figure VEG-2: Frequency of shrubs at pasture 1 trend site



Pasture 2 – Carter Spring

Table VEG-3: Rangeland Health Field Assessment for pasture 2

Pasture 2: Rangeland Health Assessments (RHAs) *Approximately 50% pasture 2 burned in 2007 Crutcher fire*			
Unburned		**Burned (2007 fire)**	
#	**Ecological Site**	**#**	**Ecological Site**
1	Very Shallow Claypan 12-16" ppt	1	Stoney Loam 10-14" ppt
1	Loamy 12-16" ppt	**1**	**Total Burned**
2	**Total Unburned**		

Unburned Area
Of the two unburned sites, the Loamy site has the greatest departure from potential, with scattered juniper that is currently expanding, a higher-than-expected shrub component (particularly an abundance of rabbitbrush), and cheatgrass as a co-dominant with other native grasses. There is also an overabundance of shallow-rooted perennial grasses and lower-than-expected numbers of deep-rooted perennial grasses. This site has a moderate departure from the potential ecological site in terms of structural/functional group. While this site exhibits a diversity of species, the ratios of desirable species are out of balance with the ecological site description, juniper is scattered and increasing, and cheatgrass has a stronger presence. The overall biotic rating for this site is a moderate departure. In contrast, the Shallow Claypan site has a trace amount of juniper present, a shrub component that is in balance with the ecological site description and a lack of cheatgrass presence. The slight-to-moderate departure in functional/structural group is due to shallow bunchgrass (Sandberg, squirreltail) composition that is higher than expected and large bunchgrass (bluebunch wheatgrass, Idaho fescue, needlegrass) composition that is lower than expected. The Shallow Claypan site is likely more ecologically balanced because it burned in 1991, prior to the Crutcher fire of 2007, thus keeping juniper at bay and decreased competition for nutrients, sunlight and soil moisture in the native understory.

Biotic integrity within the unburned portions of pasture 2 has a moderate departure for the Loamy site and a slight-to-moderate departure for the Shallow Claypan site.

Burned Area
The very shallow Stony Loam site is located on the perimeter of the burn in a mosaic burn pattern, which means the site was only partially affected. A slight-to-moderate departure is noted for two of the nine biotic indicators (soil surface loss, invasive plants); the remaining seven indicators have a departure rating of none-to-slight. Cheatgrass and other associated exotic annuals are present primarily in disturbed areas. Given the patchy nature of the burn, juniper continues to be a component of the site that is beyond ecological site potential.

The burned sites have an overall rating for biotic integrity none-to-moderate, based on the presence of juniper at the assessed site.

Noxious Weeds
No known noxious weeds were reported in GIS and therefore in this pasture.

Table VEG-4: Upland Trend Data for pasture 2

Pasture 2: Upland Trend *One Trend Site located outside the 2007 Crutcher Fire perimeter.*					
Years of Data Collection		**1995**	**2001**	**2007**	**2011**
	Long-Term Trend				
	perennial grasses/shrubs	X	X	X	X
	mountain big sagebrush		X	X	X
	Short-Term Trend			X	X

The ecological description of this Shallow Claypan trend site identifies the dominant shrub component as low sage and dominant bunchgrasses as bluebunch wheatgrass and Idaho fescue, with Sandberg bluegrass and squirreltail a minor component. Native perennial grasses appear to have an overall static long-term and short-term trend, with Idaho fescue and squirreltail showing a slight short-term decline (Figure VEG-3). Low sagebrush has a long-term and short-term increase in trend (Figure VEG-4). Mountain big sagebrush has a static trend from 2001 to 2011, yet a sharp short-term decline in frequency. Trend data indicate a long and short-term static trend for green rabbitbrush (*Ericameria teretifolia*). Cheatgrass did not show any marked changes in the long or short-term frequency data.

Figure VEG-3: Frequency of native perennial grasses at the trend site in pasture 2

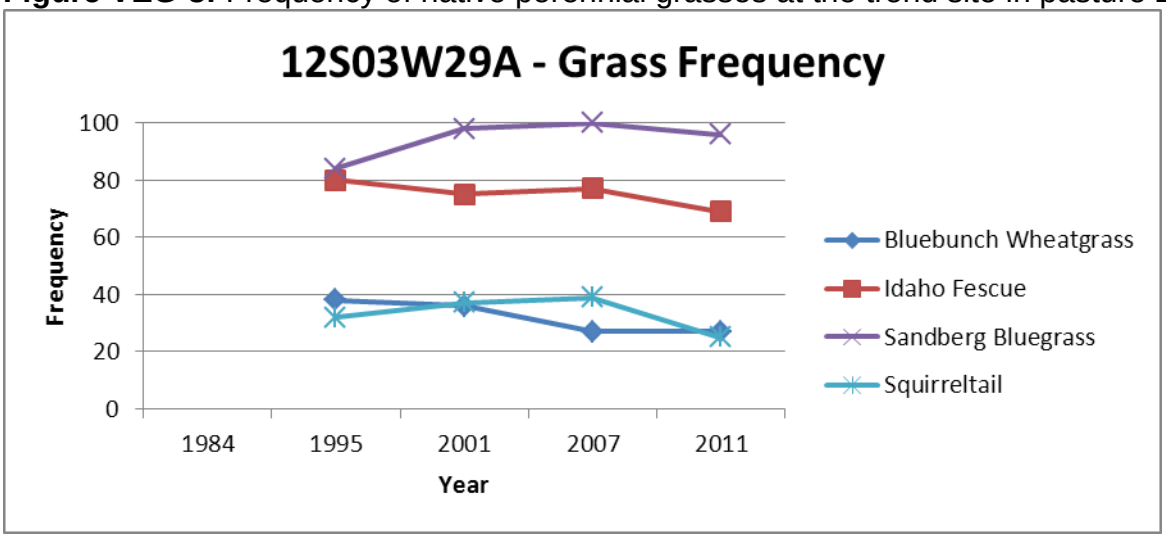
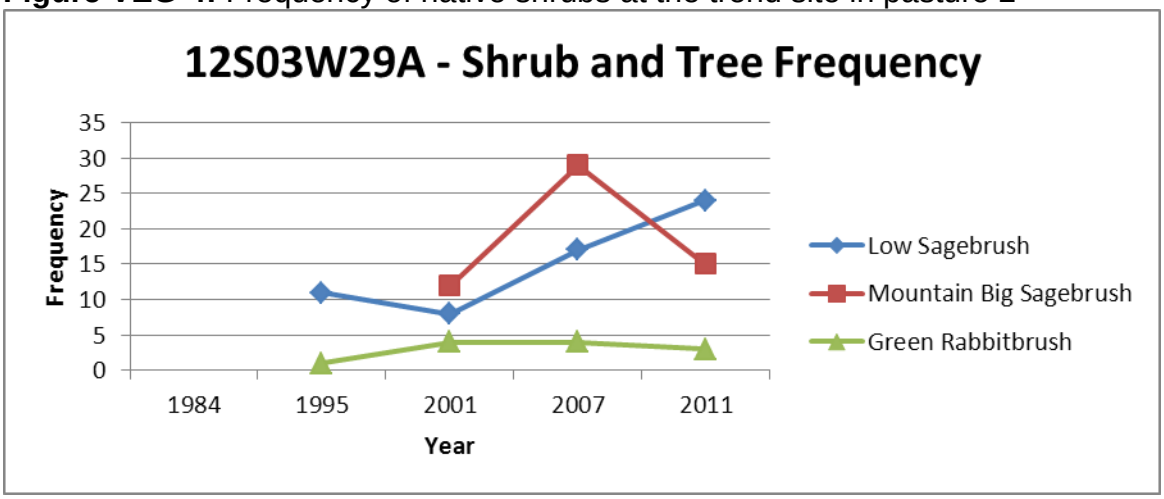


Figure VEG-4: Frequency of native shrubs at the trend site in pasture 2



Pasture 3 – Red Basin

Table VEG-5: Rangeland Health Field Assessment for pasture 3

Pasture 3: Rangeland Health Assessments (RHAs) *Approximately 85% of pasture 3 burned in 2007 Crutcher fire*			
Unburned		**Burned (2007 fire)**	
#	**Ecological Site**	**#**	**Ecological Site**
1	Shallow Breaks 14-18" ppt	2	Very Shallow Claypan 12-16" ppt
1	**Total Unburned**	**2**	**Total Burned**

Unburned Area
The shallow breaks ecological site is characterized by shallow rocky soils. Rock outcrops are common to frequent and can account for up to 50 percent of the ground surface (USDA Natural Resources Conservation Service, 2003). The assessment indicates eight out of nine ratings at a none-to-slight departure from ecological site potential. The only slight-to-moderate departure is for invasive plants; cheatgrass has an occasional presence. The heavy dominance of juniper is expected for this ecological site due to the site's difficulty in carrying a fire with the rocky conditions, large interspaces, generally gravelly ground cover, and naturally low litter composition that provide refuge and dampen widespread burning of juniper stands.

Biotic integrity for this site is summarized with a slight-to-moderate departure, based on the presence of cheatgrass.

Burned Area
Both Shallow Claypan sites appear to be located within a mosaic burn, with adjacent unburned communities displaying a stronger juniper presence. All indicators at one site have a none-to-slight departure from ecological potential and a biotic attribute rating of

slight-to-moderate, due to the lack of shrub component, which was obvious in photo documentation. The remaining unburned site has six of nine indicators with a none-to-slight departure. Soil surface loss and invasive plants have a slight-to-moderate departure, and soil surface erosion has a moderate departure. Annual weeds are scattered throughout this site. The plant community displays an imbalance in the functional/structural group due to a lack of shrub cover relative to what is expected and a higher value than expected for Sandberg bluegrass, a shallow-rooted perennial grass.

Overall, the unburned sites have a combined biological attribute rating of a slight-to-moderate departure from ecological potential.

Biotic integrity within pasture 3 is summarized with a slight-to-moderate departure from site potential for unburned and burned sites.

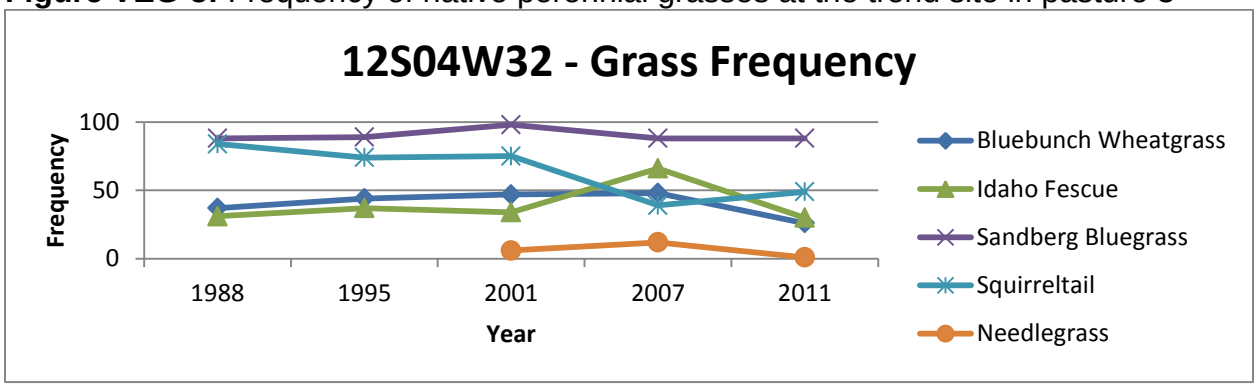
Noxious Weeds
No known noxious weeds occur in this pasture.

Table VEG-6: Upland Trend Data for pasture 3

Pasture 3: Upland Trend *One Trend Site located within the 2007 Crutcher Fire perimeter.*						
Years of Data Collection		**1988**	**1995**	**2001**	**2007**	**2011**
	Long-Term Trend	X	X	X	X	X
	needlegrass			X	X	X
	Short-Term Trend				X	X

The ecological description of this Shallow Claypan trend site identifies the dominant shrub component as low sage and dominant bunchgrasses as bluebunch wheatgrass and Idaho fescue, with Sandberg bluegrass and squirreltail a minor component. There are no frequency data for shrubs at this site. Frequency data for Sandberg bluegrass indicate a long-term and short-term static trend. Squirreltail depicts a frequency trend with a long-term decline and a short-term spike. Needlegrass, bluebunch wheatgrass and Idaho fescue show a long-term frequency of generally static with a short-term decline (Figure VEG-5). Cheatgrass frequency data indicate a statistically significant increase for the long- and short-term trend, with a significant jump from 2001 to 2007.

Figure VEG-5: Frequency of native perennial grasses at the trend site in pasture 3



Pasture 4 – Lambert Table

Table VEG-7: Rangeland Health Field Assessment for pasture 4

Pasture 4: Rangeland Health Assessments (RHAs) *Pasture 4 did not burn in the 2007 Crutcher fire.*	
#	**Ecological Site**
5	Clayey 12-16" ppt
2	Shallow Claypan 12-16" ppt
4	Loamy 12-16" ppt
11	**Total Unburned**

Lambert Table is the only pasture in the Castlehead allotment that was not impacted by the 2007 Crutcher fire; thus, all of the 2001 and 2009 RHFA records can be used there in the assessment. This was the only pasture not rested for two growing seasons after the fire.

The plant mortality and reproductive capability indicators are relatively consistent across the pasture with a none-to-slight departure from ecological condition. The indicators that raise concern are soil surface resistance to erosion, soil surface loss, and functional/structural groups, all three of which display a slight to moderate departure when averaged across all sites. Biological soil crusts and pedestalling were noted as issues, along with mechanical damage at one site. While species diversity appears to be sufficient, vegetative composition as a whole is imbalanced in comparison to ecological potential. A shift in dominance from deep-rooted bunchgrasses such as Idaho fescue and bluebunch wheatgrass to Sandberg bluegrass and a lack of biological soil crust are the issues driving a solid slight-to-moderate departure in functional/structural groups. Cheatgrass is present throughout all sites, with a varied presence, and primarily in disturbed areas on eight sites, with a significant presence on three sites.

Biotic integrity for pasture 4 is summarized with a slight-to-moderate departure from site potential, with the functional/structural groups and soil surface loss as issues of concern for future management.

Noxious Weeds
Scotch thistle (*Onopordum acanthium*) is the only known noxious weed within this pasture. It is known from one site approximately 0.1 acres in size in the northeast corner of the Lambert Table pasture. Chemical treatments were implemented in 2006, 2007, and 2009. This site will continue to be treated as a part of the Boise District weed program.

Table VEG-8: Upland Trend Data for pasture 4

Pasture 4: Upland Trend *One Trend Site located outside the 2007 Crutcher Fire perimeter.*						
Years of Data Collection		**1988**	**1995**	**2001**	**2007**	**2011**
	Long-Term Trend	X	X	X	X	X
	big sagebrush		X	X	X	X
	Short-Term Trend				X	X

The ecological description of this Clayey site identifies the dominant shrub component as low sage and dominant bunchgrasses as Idaho fescue and bluebunch wheatgrass, with bluegrasses a minor component. Long-term frequency data depict a slight increase in trend for bluebunch wheatgrass and Idaho fescue. Sandberg bluegrass has a trend that is fairly steady for long-term frequency, while squirreltail has an apparent decline in long-term trend for frequency. The data show that all native perennial grasses have a short-term decline in frequency from 2007 to 2011. Low sagebrush data indicate a long-term decrease in frequency and a slight decrease in the short-term (2007-2011). Big sagebrush maintains a steady state for the long and short-term trend.

Figure VEG-6: Frequency of native perennial grasses at the trend site in pasture 4

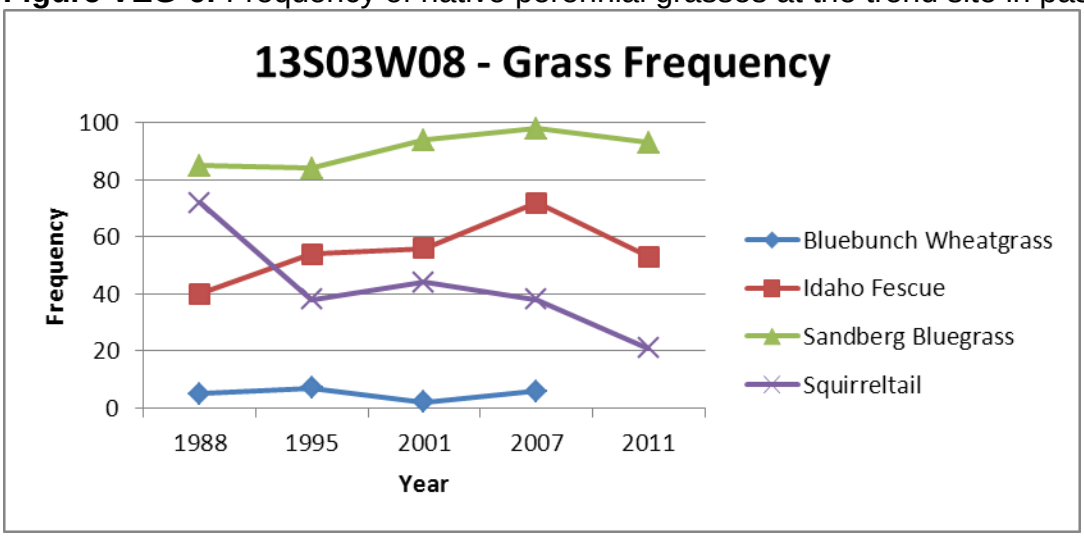
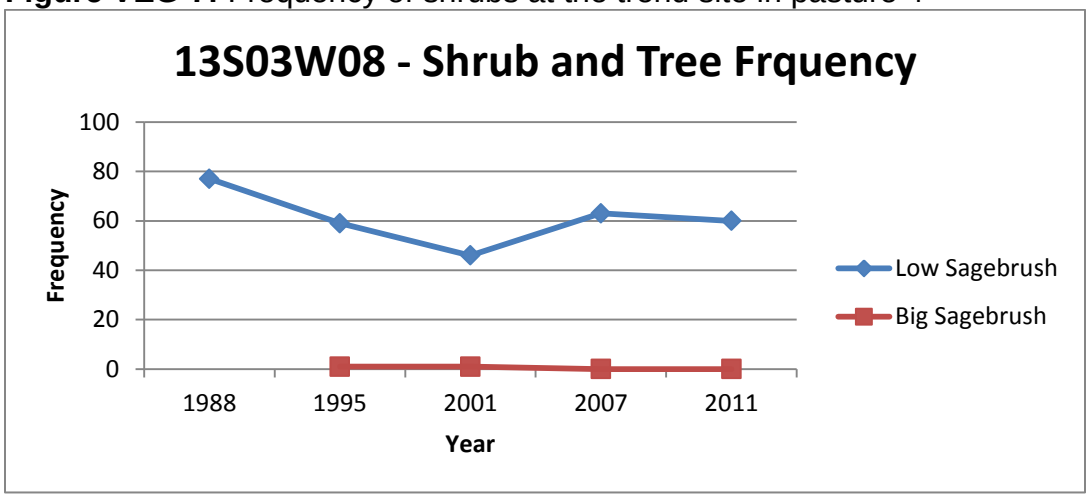


Figure VEG-7: Frequency of shrubs at the trend site in pasture 4[9]



Pasture 5 - Horse

Table VEG-9: Rangeland Health Field Assessment for pasture 5

Pasture 5: Rangeland Health Assessments (RHAs) *Approximately 100% of pasture 5 burned in 2007 Crutcher fire*			
Burned			
#	**Ecological Site**		
1	Loamy 13-16" ppt		
1	**Total Unburned**		

Six of the nine biotic indicators have a none-to-slight departure from ecological potential. Soil surface erosion, soil surface loss and invasive plants have a slight-to-moderate departure. Historic loss of soil could be attributed to juniper encroachment. Annual weeds are present in disturbed areas. The functional/structural group, while rated none-to-slight, does indicate a strong bluegrass dominance that is out of balance with the ecological potential of the site.

Biotic integrity of the site is at a slight-to-moderate departure from ecological potentials based on soils, annual weeds and bluegrass dominance.

Noxious Weeds
No known noxious weeds occur in this pasture.

Upland Trend Data
No trend sites are located within this pasture.

[9] A data point with the value of '0' was added for both 2007 and 2011 under Big Sagebrush based on trend photos and original datasheets.

Evaluation of Standard 4

The 2007 Crutcher Fire, a large mid-summer wildfire, burned approximately 23,000 acres in the Red Basin, Carter Spring, Mountain, and Castlehead pastures. A number of smaller fires have burned portions of the allotment within the past 20 years, including: the 2000 Meadow Fire, which burned primarily within the Swisher Springs allotment but included some acreage in the east-central portion of Carter Spring pasture; the 1999 Red Canyon Fire, which burned 242 acres in the western portion of the Mountain pasture; the 1992 Roaring Spring Fire, which also burned 158 acres in the western portion of the Mountain pasture; and the 1991 Red Canyon Fire, which burned 2,356 acres in the Red Basin and Carter Spring pastures.

Analysis of data and information from 2001 field work and the 2003 assessment document, as amended by data and information from the 2009 Rangeland Health Field Assessments, data from long-term trend plots and 2010 post-fire monitoring of burned and unburned portions of the pasture, are interpreted for each of the pastures and for the allotment as a whole.

Pasture 1 - Castlehead and Pasture 6 – Between-the-Canyons
Rangeland health information from 2001 field assessments and 2009 field assessments, as well as post-fire ESR monitoring data, identify unburned sites in mountain big sagebrush vegetation communities (Loamy 13-16” sites) and mountain shrub vegetation communities (Mahogany Upland 14-16” sites) of pasture 1, which are dominated by juniper, with a resulting loss of the potential sagebrush and bunchgrass component. These data identify a dis-climax due to juniper dominance. Although juniper is recognized as a frequent occurrence within the Mahogany Upland site at potential, its ability to increase to the point of severely reducing nearly all of the understory species is exhibited within pasture 1, where juniper has also become established in Loamy 13-16” sites.

When compared to assessments for sites within burned areas and ecological site guides, unburned sites identify communities with a reduced dominance of bunchgrass species, as well as a reduction in the sagebrush species or mountain shrub species, from the potential production and composition for these species within these sites. Potential sagebrush steppe vegetation has been lost through competition with mature juniper for soil moisture, nutrients, and solar energy.

These data also identify vegetation communities within burned areas that have been released from competition with juniper to return to the potential vegetation composition of sagebrush steppe and mountain shrub communities consistent with site potential. Residual impacts from competition with juniper continue to be expressed as a departure from potential for functional-structural groups. The assessment report for the Castlehead-Lambert allotment completed by the Owyhee Field Office in 2003 identified a reduction in grasses that dominate at site potential (primarily bluebunch wheatgrass) and an abundance of grasses that form a minor component at site potential (primarily Sandberg bluegrass). These trends continued within the documentation of indicators of

rangeland health recorded two years following the 2007 fire and within the ESR report completed three years following the fire. Reduction of juniper dominance as a result of the 2007 Crutcher Fire and recovery of the site toward potential has been initiated within sites which burned. Rest from livestock grazing for two growing seasons following the fire likely facilitated the recovery of fire impacted species which make up the composition at site potential.

Similarly, shrub species within the Mahogany Upland site have initiated recovery toward the potential composition of a diversity of shrub species but remain dominated by those species that respond immediately following fire - primarily ceanothus, which sprouts from seed (USDA Forest Service, 2011). Less fire-tolerant species, primarily mountain mahogany, which is a major component of site potential and only weakly sprouts from its base following fire, will require additional time in the absence of further disturbance to return to the site at dominance consistent with potential.

Short-term data from one trend plot for pasture 1 (located within the 2007 burned area) identifies an increase in frequency of bluebunch wheatgrass between 2001 and 2009. Similarly, these data identify a reduction in shrub frequency during that same period. These data support the indications in RHFAs that identify burned sites as more closely resembling site potential, aside from the expected slower recovery of shrub component. The short-term reduction in frequency of Idaho fescue, a second bunchgrass species that dominates at site potential, is likely the result of direct fire impacts. Idaho fescue is reported to be more sensitive to fire than bluebunch wheatgrass (USDA Forest Service 2011).

Wildfire appears to be the major factor contributing to recent change of biotic function in vegetation communities of pasture 1. As a result of juniper dominance and subsequent suppression of desirable understory vegetation, recorded information for four of five Rangeland Health Field Assessments and supporting information from the ESR monitoring report and trend data indicate that the biotic integrity of unburned portions of pasture 1 departs from potential to a degree leading to a conclusion that these areas do not meet Standard 4 – Native Plant Communities. Even though the shrub component is below potential, as expected post-fire, those sites burned in the 2007 Crutcher fire appear to be making progress toward recovery of biotic integrity and meeting Standard 4. These findings differ from the findings in the Owyhee Field Office 2003 determination document, which concluded that standard 4 was met in pasture 1. Concern about livestock utilization levels expressed in the 2003 determination are somewhat lessened by the additional herbaceous production following the 2007 fire.

Pasture 2 – Carter Spring

Rangeland Health Field Assessments completed for pasture 2 are consistent with data recorded for pasture 1. Although a greater portion of pasture 2 is composed of Loamy 12-16” and Shallow Claypan 12-16” sites, a small western portion of the pasture includes the Mahogany Upland site where a source of juniper encroachment into shrub-dominated vegetation communities is present. Many unburned areas appear to be held

in a dis-climax by the presence or dominance of juniper, which competes with potential sagebrush steppe species.

The assessments identify a reduction of the major bunchgrass species that dominate these sites at potential (bluebunch wheatgrass and Idaho fescue), with an increase of those bunchgrass species that form a minor component at potential, primarily Sandberg bluegrass. The presence of cheatgrass, especially in the vicinity of past disturbances, is also noted in the Rangeland Health Field Assessments.

Trend data are consistent with Rangeland Health Field Assessments, also indicating components of the vegetation communities that are not present at site potential. Although the trend in frequency of the two major bunchgrass species present at site potential is static, bluebunch wheatgrass appears to be underrepresented as compared to the recorded frequency of Idaho fescue. Sandberg bluegrass also appears to be overrepresented in the frequency data as compared to site descriptions. An additional component of the vegetation community that is inconsistent with those species present at site potential is the presence and static trend in green rabbitbrush, a species which, though present at site potential, indicates past disturbance. The presence of cheatgrass, an annual invasive species, also is a component of the current vegetation community, which is inconsistent with site potential. The assessment report for the Castlehead-Lambert allotment completed by the Owyhee Field Office in 2003 also identified a reduction in bunchgrasses, which dominate at site potential (primarily bluebunch wheatgrass) and an abundance of grasses that form a minor component at site potential (primarily Sandberg bluegrass).

As with pasture 1, wildfire appears to be a major factor contributing to recent change of biotic function in some vegetation communities of pasture 2. Rangeland Health Field Assessment information and trend data that identify juniper dominance and subsequent suppression of desirable understory vegetation leads to a finding that the biotic integrity of unburned portions of pasture 2 depart from potential to a degree supporting a conclusion that these areas do not meet Standard 4 – Native Plant Communities. Those portions of pasture 2 where juniper was reduced or eliminated from the vegetation composition by fire appear to be making progress toward recovery of biotic integrity and meeting Standard 4. These findings differ from the findings in the Owyhee Field Office 2003 determination document which concluded that standard 4 was not met in most areas of pasture 2. That document also expressed concern within pasture 2 for providing periodic rest or deferment from livestock grazing use during the critical growing season.

Pasture 3 – Red Basin

As with Rangeland Health Field Assessments completed for pasture 2, assessments completed for pasture 3 identify juniper dominance in unburned areas, the limited presence of sagebrush, the imbalance of dominant bunchgrasses with a higher-than-potential presence of Sandberg bluegrass, and the minor presence of cheatgrass as factors that contribute to departure from site potential.

The inclusions that the Shallow Breaks ecological sites occupy within pasture 3 play a key role. Shallow Breaks is dominated by juniper at potential, which provides a source for its increase in adjoining sagebrush-bunchgrass dominated communities to the point of severely reducing nearly all of the understory species. Although fire mapping identifies that the majority of the pasture burned during the 2007 fire, rangeland health data indicate that the presence of juniper outside the Shallow Breaks ecological site remains a concern for attaining biotic integrity within the pasture.

Trend data at the one Shallow Claypan site support the indications of deviation from site potential with no sagebrush component recorded in either frequency or shrub density data. Shrub density data recording the presence of green rabbitbrush and the lack of sagebrush indicate a site with disturbance. The assessment report for the Castlehead-Lambert allotment completed by the Owyhee Field Office in 2003 also identified a lack of shrubs at the trend plot location since the time since the plot was established.

Frequency data for bunchgrass species appear to identify a vegetation community with many of the potential bunchgrasses species represented. The recent downward trend for both Idaho fescue and needlegrass may result from their limited ability to tolerate fire (USDA Forest Service, 2011). Similarly, fire effects could explain the short-term downward trend for bluebunch wheatgrass frequency as a result of fuels from old plant material and static trend for Sandberg bluegrass which would have limited fuel from old plant material.

Wildfire appears to be a major factor contributing to recent change of biotic function in most vegetation communities of pasture 3. Within this, juniper dominance does not appear to be as large of a factor influencing the deviation from vegetation site potential as indicated for pastures 1 and 2; recent and historic fire impacts may contribute to the lack of sagebrush recorded at the trend plot and the occurrence of cheatgrass and other annual species within the pasture.

Rangeland health information and trend data lead to a finding that the biotic integrity of pasture 3 departs from potential to a degree supporting a conclusion that many portions of the pasture do not meet Standard 4 – Native Plant Communities. This finding is the same as the findings in the Owyhee Field Office 2003 determination document, which concluded that Standard 4 was not met in most low sagebrush communities and burned big sagebrush communities of pasture 3. That document also expressed concern within pasture 3 for providing periodic rest or deferment from livestock grazing use during the critical growing season.

Pasture 4 – Lambert Table

Lambert Table differs from the other pastures in the Castlehead-Lambert allotment in that juniper encroachment has not contributed to the departure of indicators of rangeland health from site potential. Additionally, the absence of recent recorded fire within the pasture has resulted in the current biotic integrity of native vegetation communities resulting primarily from past and current livestock management practices.

The overall departure rating from site potential for pasture 4 is slight-to-moderate for biotic integrity. Dominant bunchgrasses that are expected at site potential occur at a reduced incidence. Additionally, minor occurrence of soil surface loss and erosion was observed. Cheatgrass is present in minor amounts (2 to 5 percent canopy cover) in areas of disturbance. Even with these concerns the biotic integrity indicators when compared to ecological site descriptions leads to a finding that biotic attributes within the allotment are somewhat similar to those present at ecological site potential. Although vegetation communities with a full complement of dominant grass and shrubs consistent with site potential are not present within the allotment and a minor component of invasive species is recorded, healthy, productive, and diverse populations of native plants are maintained to provide for proper nutrient cycling, hydrologic cycling, and energy flow. The RHFA data indicate the biotic integrity of pasture 4 is mildly compromised and is meeting Standard 4 (RHFA ratings Appendix D).

Short-term downward trend in frequency of bunchgrass plants may be the product of recent repeated growing season use during periods of stabilization and rehabilitation actions which resulted in rest of other pastures of the allotment following the 2007 Crutcher Fire.

Rangeland health information and trend data lead to a conclusion that the biotic integrity of pasture 4 departs little from potential, supporting a conclusion that most portions of the pasture meet Standard 4 – Native Plant Communities. This finding is the same as the findings in the Owyhee Field Office 2003 determination document that concluded that standard 4 was generally met in pasture 4. That document also expressed concern within pasture 4 for providing periodic rest or deferment from livestock grazing use during the critical growing season.

Pasture 5 – Horse

Although limited information or data are available, the one Rangeland Health Field Assessment within pasture 5 identifies many of the indicators and contributing factors to departure from biotic function that are present in other pastures of the Castlehead-Lambert allotment. Those factors include juniper dominance in unburned areas, the imbalance of dominant bunchgrasses with a higher-than-potential presence of Sandberg bluegrass, and the minor presence of cheatgrass as factors which contribute to departure from site potential.

Rangeland health information leads to a conclusion that the biotic integrity of pasture 5 departs little from potential, supporting a conclusion that most portions of the pasture meet Standard 4 – Native Plant Communities. This finding is the same as the findings in the Owyhee Field Office 2003 determination document which concluded that standard 4 was met in pasture 5.

Evaluation Finding –allotment/watershed is:
__ Meeting the Standard
__ Not meeting the Standard, but making significant progress towards meeting
_X_ Not meeting the Standard

Rationale for Evaluation Finding

The standard for Native Plant Communities is not met within Loamy and Shallow Claypan ecological sites of Castlehead-Lambert allotment, where juniper encroachment and dominance is present and its occurrence is not a portion of site potential. Juniper dominance outside a limited occurrence in the Savanna Upland ecological site or dominance within the Shallow Breaks ecological site is a departure from potential vegetation within the allotment. Wildfire in 2007, which burned in portions of pastures 1, 2, and 3, has reduced juniper dominance within burned portions and progress toward vegetation recovery and site potential is occurring. Juniper dominance is not a current concern within the Lambert Table pasture.

As a whole, sagebrush steppe vegetation communities within the allotment exhibit vegetation functional-structural groups that vary from site potential, with an underrepresentation of dominant bunchgrass species for the sites, primarily bluebunch wheatgrass and Idaho fescue, and a representation of Sandberg bluegrass at higher than the minor component described in site guides. Wildfire history appears to be a major factor contributing to current departure from potential biotic function in most vegetation communities. Although the slight to moderate departure from potential for biotic integrity within pasture 4 does not push the pasture to not meeting Standard 4, livestock grazing appears to be the strongest influence for this departure, given there have been no recent fires within the pasture. A concern remains that livestock management practices are not providing periodic rest or deferment from livestock grazing use during the critical growing season.

Information sources

Bunting, S.C., J.L. Kingery and E. Strand. 1999. Effects of succession on species richness of the western juniper woodland/sagebrush steppe mosaic. In: S.B. Monsen and R. Stevens, compilers. Proceedings: Ecology and management of pinyon-juniper communities within the Interior West. USDA For. Ser. Gen. Tech. Rep. RMRS-P-9, pp. 76-81.

USDA U.S. Forest Service. 2011. Fire Effects Information System web page. http://www.fs.fed.us/database/feis/

Standard 5 – Seedings _X_ Standard Doesn't Apply

Rangelands seeded with mixtures, including predominately non-native plants, are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow and the hydrologic cycle.

Indicators may include but are not limited to:

1. In established seedings, the diversity of perennial species is not diminishing over time.

2. Plant production, seed production, and cover are adequate to enable recruitment when favorable climatic events occur.
3. Noxious weeds are not increasing.
4. Adequate litter and standing dead plant material are present for site protection and for decomposition to replenish soil nutrients relative to site potential.

Rangeland Health Assessment

Through a review of rangeland health standards assessments, monitoring data, and project files the presence of seeded plant communities have not been identified within the Castlehead-Lambert allotment.

Evaluation of Standard 5

Evaluation Finding – allotment/watershed is: N/A
__ Meeting the Standard
__ Not meeting the Standard, but making significant progress towards meeting
__ Not meeting the Standard

Rationale for Evaluation Finding

Information Sources

Standard 6 – Exotic Plant Communities, Other Than Seedings _X_

Standard Doesn't Apply

Exotic plant communities, other than seedings, will meet minimum requirements of soil stability and maintenance of existing native and seeded plants. These communities will be rehabilitated to perennial communities when feasible cost effective methods are developed.

Indicators may include but are not limited to:
1. Noxious weeds are not increasing.
2. Perennial species numbers are being maintained.
3. Native and introduced perennial species are vigorous enough to reproduce when climatic and other environmental conditions are favorable.
4. Litter and standing dead plant material is adequate to replenish soil nutrients relative to site potential.

Rangeland Health Assessment

Although the presence of exotic plant communities has been identified within Castlehead-Lambert allotment, the occurrence of cheatgrass and other invasive species and their potential for expansion to dominate vegetation communities is limited and has been incorporated into discussions under Standard 4 – Native Plant Communities.

Evaluation of Standard 6

Evaluation Finding – allotment/watershed is: N/A
__Meeting the Standard
__Not meeting the Standard, but making significant progress towards meeting
__ Not meeting the Standard

Rationale for Evaluation Finding

Information Sources

Standard 7 – Water Quality

__ Standard Doesn't Apply

Surface and groundwater on public lands comply with the Idaho Water Quality Standards.

Indicators may include but are not limited to:
1. Physical, chemical, and biologic parameters described in the Idaho Water Quality Standards.

Rangeland Health Assessment

Overview
The Idaho Department of Environmental Quality (IDEQ) is the state agency tasked with complying with and implementing the federal Clean Water Act. IDEQ sets the states standards through their integrated report and beneficial use process. On stream segments listed as water quality limited in the current IDEQ 303(d) list, Idaho BLM is expected to implement grazing practices that make progress towards achieving proper functioning condition and satisfactory riparian condition.

The Castlehead-Lambert allotment is within the Lower Owyhee River watershed that was assessed by IDEQ in 2002 (integrated report) and reviewed in 2009 (5-year review). The watershed was assigned beneficial uses that include: cold water aquatic life, and primary and secondary recreation contact. Cold-water aquatic life water bodies are defined as "water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species." Streams within the allotment that are identified by IDEQ as not supporting the beneficial use include Beaver, Castle, Little Smith, Red Canyon Creeks, and their tributaries. Streams that have been through the reconnaissance process and were placed on the 303(d) list due to excessive sedimentation and siltation include Beaver and Little Smith Creeks (Map 5), and their tributaries. Only those streams on the 303(d) list will be discussed for the remainder of this standard.

Previous Assessment Summary
The Castlehead-Lambert Rangeland Health Assessment dated June 2003 discussed the IDEQ watershed assessment and the results of BLM monitoring of water temperatures and bacteria levels. The assessment concluded that water temperatures in the East and West Fork of Red Canyon, Red Canyon, and Little Smith Creeks exceeded the IDEQ criteria for support of the cold water aquatic life beneficial use. Specific issues identified include: poorly vegetated and unstable streambanks resulting in elevated levels of sediment.

Current Assessment

Pasture 1 – Castlehead
Portions of both Beaver and Little Smith Creeks that occur in pasture 1 are on the IDEQ 303(d) list as impaired waters (Map 5). The BLM has monitored water temperatures in both the East Fork and West Fork of Red Canyon (Figures WATR 1 and 2); both streams exceeded the State's criteria for support of the cold water aquatic life beneficial use. The criteria, as defined by the State, sets a Maximum Daily Maximum Temperature (MDMT) of 22° C and a Maximum Daily Average Temperature (MDAT) of 19° C.

Figure WATR 1: EF Red Canyon Temperature Information, 2004
(MDMT = 32.1°C and MDAT = 16.6°C)

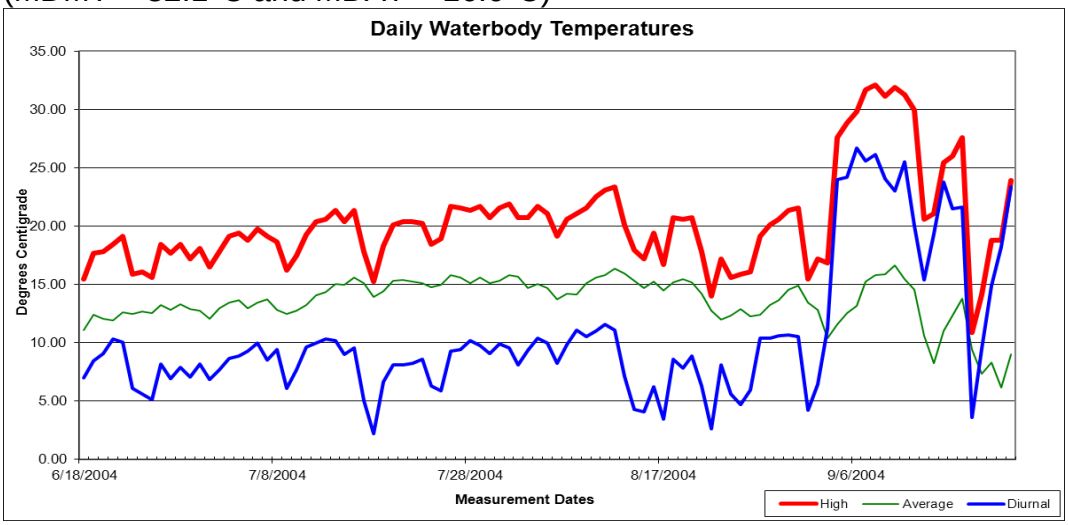
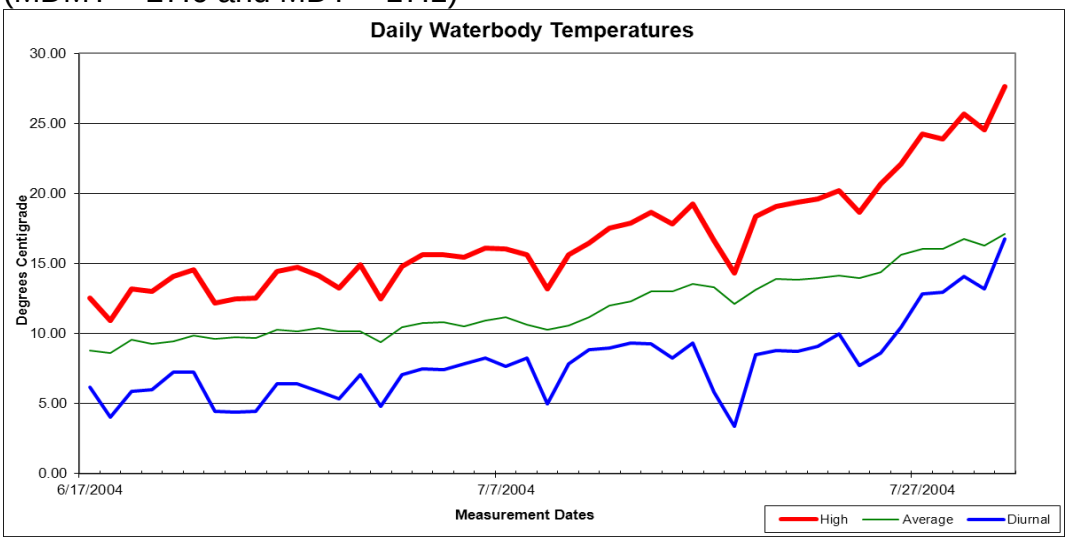


Figure WATR 2: WF Red Canyon Temperature Information, 2004
(MDMT = 27.6 and MDT = 17.1)



Pasture 2 – Carter Spring
Both Beaver and Carter Creek occur within pasture 2 and are on the IDEQ 303(d) list (Map 5). BLM has not monitored water temperature or bacterial levels in pasture 2.

Pastures 3-5
None of the streams in pastures 3, 4, or 5 are on the IDEQ 303(d) list of impaired waters, nor does BLM have any water quality monitoring sites in this pasture.

Evaluation of Standard 7

Evaluation Finding – allotment/watershed is:
__ Meeting the Standard
__ Not meeting the Standard, but making significant progress towards meeting
_X_ Not meeting the Standard

RMP Objectives/ Desired Conditions:
Meet or exceed State of Idaho water quality standards on all Federally administered waters within the Owyhee Field Office. Follow current State water rights processes and procedures to acquire water rights for beneficial uses and support establishment of in-stream flows which are in the public interest.

Rationale for Evaluation Finding

BLM has monitored water temperatures and concluded that temperatures in the East and West Fork of Red Canyon, Red Canyon, and Little Smith Creeks exceeded the

IDEQ criteria for support of the cold water aquatic life beneficial use. Specific issues identified include poorly vegetated and unstable streambanks resulting in elevated levels of sediment. For these reasons, this allotment does not meet Standard 7.

Information Sources:

Idaho Department of Environmental Quality. 2002. Lower Owyhee Watershed Integrated Report. http://www.deq.idaho.gov/media/458038-integrated_report_2002_final_entire.pdf

Idaho Department of Environmental Quality. 2009. Lower Owyhee Watershed Five Year Review. http://www.deq.idaho.gov/media/455477-_water_data_reports_surface_water_tmdls_owyhee_watershed_upper_owyhee_watershed_upper_five_year_review_0609.pdf

Idaho Department of Environmental Quality Lower Owyhee Watershed TMDLs: http://www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls.aspx

USDI Bureau of Land Management. 1999. Owyhee Resource Management Plan. Available at the Owyhee Field Office, Marsing, Idaho.

Standard 8 – Threatened And Endangered Plants and Animals __

Standard Doesn't Apply

Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.

Indicators may include but are not limited to:

1. Parameters described in the Idaho Water Quality Standards.
2. Riparian/wetland vegetation with deep, strong, binding roots is sufficient to stabilize streambanks and shorelines. Invader and shallow rooted species are a minor component of the floodplain.
3. Age class structure diversity or riparian/wetland vegetation is appropriate for the site.
4. Native plant communities (flora and microbiotic crusts) are maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant species.
5. The diversity of native species is maintained.
6. The amount and distribution of ground cover, including litter, for identified ecological site(s) or soil-plant associations are appropriate for site stability.
7. Noxious weeds are not increasing.

Rangeland Health Assessment

Plants

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

No plants listed under the Endangered Species Act are known or suspected to occur within the Castlehead allotment (USDI-USFWS 2009). Slickspot peppergrass (*Lepidium papilliferum*) is listed as threatened under the Endangered Species Act and occurs in eastern Owyhee County but is not currently known from western Owyhee County or the Owyhee Field Office Area (USDI-USFWS 2010b). No soil types containing slickspot microsites are known to occur in the Castlehead allotment. Southwest Idaho is no longer considered within the range of Ute ladies'-tresses (which were mentioned in the 2001 Assessment). Therefore, these plants will not be discussed further.

Two BLM special status plant species are known to occur within the Castlehead allotment: thinleaf goldenhead (*Pyrrocoma linearis*)[1] in pastures 1 and 6, and mountain ball cactus (*Pediocactus simpsonii*) in pasture 3 (Table SPSS-1).

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

		Pasture & No. Occurrences					
Scientific Name	**Common Name**	**1a**	**1b**	**2**	**3**	**4**	**5**
Pyrocomma linearis	thinleaf goldenweed	1	1				
Pediocactus simpsonii	mountain ball cactus				4		

Pasture 1 Castlehead and 6 Between-the-Canyons

One occurrence of thinleaf goldenhead is known from pastures 1 and 6 Thinleaf goldenhead is a Type 3 BLM sensitive plant species - plants considered imperiled range-wide or state-wide with moderate endangerment. This perennial plant is in the sunflower family with flowering stems about 6-12" tall and narrow leaves from the basal crown. It generally begins growth in March or April, flowers in May and June, sets seed in early July, and is dormant by August. It occurs in seasonally wet meadows, drainages, and on the banks of perennial streams or springs.

Thinleaf goldenhead was found in July 2004 at one location during the botanical clearance for the mountain pasture division fence. The survey notes approximately 30 plants with some in flower. Exact fenceline location is unknown; however, the proposal was to bisect the plant site with two-thirds of the occurrence on the north and one-third on the south side of the fence.

Pasture 2– Carter Spring
There are no known special status plants in pasture 2.

Pasture 3– Red Basin
Mountain ball cactus is the only known special status plant that occurs in pasture 3. It is a Type 4 BLM sensitive plant species, which are species of concern, due to small populations or localized distribution. Among the rigid, elongated and whirled spines, this perennial barrel-type cactus bears yellow or purplish flowers in the early spring with seeds produced in June. Habitat for this species includes rocky or sandy benches and canyon rims in low sagebrush, bud sage (*Picrothamnus desertorum*), and Sandberg bluegrass communities. Mountain ball cactus has a global distribution from southern Idaho (Table 2), eastern Oregon, southern Wyoming, northeast and north central Nevada, northern Arizona and New Mexico, western South Dakota, Montana, Kansas, Utah, Colorado, and Washington (NatureServe Explorer 2011).

There are a total of four mountain ball cacti sites within pasture 3. One site is exclusively restricted to the Badlands ACEC in the northeast corner. The most recent reports (1994, 2005, and 2007) indicated plants that appeared vigorous and capable of reproducing with evidence of recent flowering or fruiting. No threats were observed at any of the sites. The occurrences are located on benches of gravelly, sparsely vegetated soils amongst old growth juniper and sculpted rhyolite outcrops. Most cacti stand threats to horticulture collection; however, the remote location of occurrences in the Castlehead-Lambert allotment provide resilience to this threat. The lack of vegetation and rocky nature typical of the habitat suggest very low probability of disturbance.

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

Rangeland Health Assessment

Wildlife

Overview
A number of wildlife species with special status occur or potentially occur within the Castlehead Lambert allotment. Special status species discussed in this document include species on the Idaho BLM State Sensitive Species List (USDI-BLM 2003) for the Owyhee Field Office. The Idaho BLM State Sensitive Species List includes species currently listed or under consideration for listing under the Endangered Species Act (ESA)(USDI-FWS 2011). In addition, many species on the list are recognized as Species of Greatest Conservation Need (IDFG 2005a), High Priority Breeding Birds (IPIF 2000), and Birds of Conservation Concern (USDI-FWS 2008). Common and scientific names of special status wildlife species, their status, key habitat associations, and information regarding occurrence and potential habitat within the allotment are summarized in Appendix E.

Although most special status species populations are poorly studied, many species likely to occur in the allotment display relatively broad ecological tolerance and are distributed throughout the Great Basin region. Therefore, only a few focal special status species will be discussed individually. These species include the greater sage-grouse, Columbia spotted frog, pygmy rabbit, and Columbia River redband trout. The USFWS has determined that sage-grouse and Columbia spotted frogs warrant listing under ESA but have been precluded due to higher priorities (i.e., candidate species). The Idaho BLM has determined that pygmy rabbit, and Columbia River redband trout are imperiled globally and rangewide (i.e., BLM Type 2 sensitive species).These species will be discussed in greater detail because they occur or possibly could occur within the allotment, and they have been the subject of targeted surveys and periodic species-specific monitoring studies.

Focal Special Status Species

Greater sage-grouse

The greater sage-grouse is a sagebrush-obligate species that requires large areas of relatively undisturbed sagebrush steppe habitat. Within this requisite sagebrush landscape, important seasonal habitats (e.g., wet meadows, higher elevation mesic shrublands) are also necessary. On March 5, 2010, the U.S. Fish and Wildlife Service submitted a new finding to the Federal Register which found that listing the greater sage-grouse was warranted but precluded by the need to take action on other species facing more immediate and severe extinction threats. The finding has changed the status of sage-grouse from a Type 2 BLM sensitive species to a Candidate species under the ESA. The allotment is located within the Northern Great Basin sage-grouse management zone IV (MZ IV) (Stiver et al. 2006). Sage-grouse in the area belong to the north-central Nevada/southeast Oregon/southwest Idaho breeding subpopulation (Connelly et al. 2004). In addition, the allotment is located on the western margin of the largest sage-grouse preliminary priority habitat area identified by recent Idaho BLM modeling efforts within MZ IV (Makela and Major 2011) (Map 2). 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 (as per WO IM 2010-071) to identify these areas in collaboration with respective state wildlife agencies.

Based on the Idaho Sage-grouse Habitat Planning Map (2011 updates), potential sage-grouse habitat occurs throughout the Castlehead Lambert allotment. Potential sage-grouse habitat within the allotment is classified as key habitat, perennial grasslands, and conifer encroachment (Table WDLF-1). However, there are substantial areas of non-habitat at higher elevations in pastures 1, 2, and 6 and in the steep canyons and rocky badlands of pastures 3 and 6 (Map 6). Much of the allotment is identified as sagebrush-limited (i.e., perennial grassland) due to several fires that occurred in 2000 and 2007. Large areas of juniper encroachment occur throughout the allotment and include patches within the burn perimeters that remained after the fires (Maps 3 and 6). Areas of key habitat occur at lower elevations in pastures 2 and cover the vast majority

of pasture 4 on Lambert Table. Key habitat within the allotment is adjacent to areas of juniper encroachment as well as on the periphery of large contiguous areas of key habitat to the east (Map 6).

Table WDLF-1: Potential sage-grouse habitat acreages on BLM lands, Castlehead-Lambert allotment, 2011

Castlehead Lambert	**Key (K)**	**Perennial Grassland (R1)**	**Conifer Encroachment (R3)**	**Total Potential Habitat**	**Non-habitat**	**Total BLM Lands**
Pasture 1	0	285	1,794	2,079	2,581	4,660
Pasture 2	487	2,850	5,136	8,473	719	9,192
Pasture 3	7	7,906	1,809	9,722	1,607	11,328
Pasture 4	11,043	75	412	11,530	13	11,544
Pasture 5	0	1,614	203	1,817	33	1,850
Pasture 6	0	2,231	1,867	4,098	3,154	7,252
Allotment Total (% of Potential Habitat)	11,537 (30% of Potential Habitat)	14,961 (40% of Potential Habitat)	11,221(30% of Potential Habitat)	37,719 (82 % of allotment)	8,107 (18% of BLM Lands)	45,826 (99% of allotment)

At least three occupied leks are known to occur within the allotment. All of these leks are located in pasture 4 on Lambert Table (Map 6). At least two of these leks were active in 2011 (Table WDLF-2). In addition, the allotment is located within the 75 percent breeding bird density (BBD) buffer (4 miles) of four other leks (Table WDLF-2). The 75 percent BBD buffer is highly correlated to breeding habitat surrounding the lek and corresponds to the high abundance (or population) component of the preliminary priority area (Makela and Major 2011).

Table WDLF-2: Lek attendance in the Castlehead-Lambert allotment or within four miles of the allotment, 2007-2011

Lek	**Location**	**Survey Year[1]**				
		2011	**2010**	**2009**	**2008**	**2007**
2O617	Pasture 4	58	6	14	--	24
2O467	Pasture 4	--	0	--	--	2
2O466	<1.5 miles SE	8	12	6	--	43
2O465	<1.3 miles SE	--	0	--	--	12
2O230	~2.6 miles E	3	--	--	--	0
2O310	<3.6 miles NE	76	80	--	--	23

[1]Surveys were not conducted in years indicated by dashes (--).

Columbia spotted frog

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

The species is highly aquatic and is seldom found far from water. The largest populations occur in structurally complex wetlands with diverse pool and meadow components. Suitable sites contain shallow breeding pools and deeper-water overwintering sites. Wet meadows, riparian wetlands, and stream courses are important as dispersal corridors among perennially occupied sites. Wetland and riparian habitat loss and degradation are the most serious threats to the maintenance of viable populations of spotted frogs (IDFG 2005).

Pygmy rabbit

The pygmy rabbit is a sagebrush-obligate species that requires tall, dense sagebrush to provide food and shelter throughout the year. Pygmy rabbits are the smallest rabbit species in North America and typically occur in sagebrush communities with relatively deep, loose soils where they are able to dig their own burrows. During winter, pygmy rabbits are almost entirely dependent on sagebrush for food. On September 30, 2010, the U.S. Fish and Wildlife Service 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 endangered species act 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 2005).

Columbia River redband trout

Redband trout of the Columbia River basin are a BLM Type 2 sensitive species. BLM manages the species to prevent future endangered species act listing as threatened or endangered. In Idaho's desert streams, redband trout prefer cool streams with temperatures below 21° C (70° F), however they can survive daily cyclic temperatures up to 27° C (80° F) for a short period of time (IDFG 2005). Habitat loss and fragmentation of currently occupied habitat are among the major threats identified as issues relevant to the maintenance of viable populations of redband trout.

Pasture 1 – Castlehead

Upland Habitat Assessment

Approximately 23 percent of pasture 1 burned in the 2007 Crutcher fire, mostly in the form of a broad strip trending southwest to northeast in the center of the pasture. The fire affected all upland habitat types, including sagebrush steppe, mountain shrub, mahogany savanna, and juniper woodlands. Functionally and structurally intact shrub communities are limited, as all unburned habitats have been impacted by varying degrees of juniper encroachment (see the Standard 4 discussion above). In these areas a diversity of forbs and grasses are present, but desirable bunchgrasses that provide nesting cover and forage for many shrub-associated species are decreasing, while shorter statured perennial grasses like Sandberg bluegrass are increasing. These conditions are most likely limiting cover for ground-nesting and -foraging birds and are not providing adequate habitat needs for most shrub-associated special status wildlife

species. In burned areas, perennial grasses and native forbs are similar to reference conditions; however, the absence of the essential shrub component is likely limiting use for many shrub-dependent special status species as shrubs provide nesting structure and foraging areas.

As previously discussed, western juniper is common to dominant throughout most of pasture 1, and while this species provides important habitat for a diversity of neotropical migratory birds, bats and other wildlife species, its encroachment into sagebrush, mountain shrub, and mahogany communities is resulting in the decline and/or loss of habitat for many sagebrush-obligate and shrub-dependent species.

Riparian Habitat Assessment

The majority of lotic riparian habitat assessed in pasture 1 is functioning-at-risk while the remainder is functioning properly (see the Standard 2 discussion above). The quality and quantity of shade, nesting habitat, forage, escape cover, and prey abundance are reduced in the functioning-at-risk stream reaches. There is also inadequate hydric vegetation cover to protect banks and dissipate energy in the large majority of the stream reaches. These reaches have a high risk of habitat loss or degradation during high flow events.

Lentic riparian/wetland vegetation is supported at many springs within pasture 1 (see the Standard 2 discussion above). The majority of these springs support habitat that appears to be adequate to provide for the needs of most dependent special status species. Some springs have reduced cover, forage, possible reductions in insect and other prey abundance, reduced water quality, and increased physical disturbance that can result in the direct destruction of nests, eggs, and young, and increased exposure of eggs and young to predation and the elements. Additionally, some springs were not visited, or they have inadequate information recorded to fully assess their condition.

Focal Special Status Species

Greater sage-grouse

Potential sage-grouse habitat is limited to the northwestern portion of pasture 1 (Map 6). This portion is less than half of the pasture and is located below one of the highest benches that are radially arranged around the summit of Juniper Mountain (Table WDLF-1). Currently, dense juniper woodlands occur above and on the steep bench slopes. More than likely, these areas do not support sage-grouse habitat because junipers are expected on the steep rocky bench slopes under natural conditions and disturbance regimes, and the juniper woodlands currently dominant on the broad prominence of the Juniper Mountain summit have replaced the mahogany savanna ecological site conditions, which in that setting would not have supported sage-grouse habitat.

Currently, key sage-grouse habitat does not occur in pasture 1 and no sage-grouse breeding habitat assessments have been conducted. The majority of potential sage-

grouse habitat in pasture 1(86 percent) has been converted to juniper woodlands (Table WDLF-1). The remaining potential habitat (14 percent) is composed of perennial grasslands that resulted from the 2007 Crutcher fire. Although the fire killed several hundred acres of juniper within this area, decay of the juniper snags and recovery of the mountain sagebrush community and sage-grouse habitat may take at least 70 years (Baker 2006).

One late brood-rearing habitat assessment was conducted in pasture 1 at a wet meadow site (i.e., Wonder Spring) above the high bench in a non-habitat area (Map 6). As expected, the site was assessed as unsuitable habitat because of the surrounding juniper woodlands, and therefore will not be discussed further.

Columbia spotted frog
There are no known occurrences within pasture 1.

Pygmy rabbit
No pygmy rabbits or evidence of their presence (i.e., burrows, pellets) were detected along five survey routes conducted in pasture 1 during 2005. Although a coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests portions of pasture 1 have a moderate likelihood of core habitat presence, suitable sagebrush habitat and soils are mostly absent.

Columbia River redband trout

According the IDFG fisheries database, redband trout are known to occupy Little Smith Creek in pasture 1, and trout are known to inhabit Castle Creek just downsteam of the allotment boundary. The majority of the trout habitat in pasture 1 is not in proper functioning condition (see Standards 2 and 3), and thus the streams are not providing adequate habitat conditions to maintain viable trout populations.

Pasture 2 – Carter Spring

Upland Habitat Assessment
Approximately 50 percent of pasture 2 burned in the 2007 Crutcher fire, primarily through the center of the pasture. The 2007 fire partially occurred in areas that have burned in the past 20 years (i.e., 1991 Red Canyon, 2000 Meadow). The fires have affected all upland habitat types, including sagebrush steppe, mountain shrub, mahogany savanna, and juniper woodlands. All unburned habitats have been impacted by varying degrees of juniper encroachment. Areas burned before 2007 show persistent signs of disturbance and slow recovery as evidenced by higher-than-expected rabbitbrush cover and an abundance of cheatgrass (see the Standard 4 discussion above). Rabbitbrush provides little in the way of nesting cover for sage-grouse, and greater-than-expected occurrence is indicative of degraded habitat conditions in the burn. Cheatgrass is scattered elsewhere in the pasture, where it is likely limiting the establishment of desirable grass and forb seedlings by competing for limited soil moisture and nutrients.

Similar to pasture 1, occurrences of desirable bunchgrasses (i.e., bluebunch wheatgrass, Idaho fescue) are lower than expected and shallow-rooted perennial grasses (i.e., Sandberg bluegrass) are higher than expected; however, all native perennial grasses display a static trend overall. Sandberg bluegrass provides inferior cover in comparison to bluebunch wheatgrass. These conditions are probably limiting cover for ground-nesting and foraging birds and are not providing adequate habitat needs for most shrub-associated special status wildlife species. In burned areas, recovery of perennial grasses and native forbs is apparent and their diversity and abundance is similar to reference conditions; however, the absence of the essential shrub component is likely limiting use for many shrub-dependent special status species, as shrubs provide nesting structure and foraging areas.

Also similar to pasture 1, western juniper is common to dominant throughout most of the pasture. Although juniper provides important habitat for a diversity of Neotropical migratory birds, bats and other species, its encroachment into sagebrush, mountain shrub, and mahogany communities is resulting in the decline and loss of habitat for many sagebrush-obligate and shrub-dependent species.

Riparian Habitat Assessment

All lotic riparian habitat assessed in pasture 2 is functioning-at-risk (see the Standard 2 discussion above). Some of the key indicators that assess structure and composition of riparian vegetation (i.e., lack of bank stabilizing species, heavy browse of woody species, high percentage of bare ground) found within all of the functioning-at-risk stream reaches in pasture 2, reveal habitat conditions that typically are inadequate to provide for the needs of many of the special status and other wildlife species dependent on this habitat type. There is also inadequate hydric vegetation cover to protect banks and dissipate energy within all of these stream reaches, leaving them at high risk of habitat loss or degradation during high flow events.

There are five springs located in pasture 2 that support lentic riparian/wetland vegetation. Although one of the five springs is developed, it does not have an exclosure to limit livestock use around the spring source. Two springs have been assessed as functioning properly and appeared to be receiving limited livestock use and are expected to be providing habitat that is adequate to provide for the needs of most dependent special status species. The remaining three springs have been assessed as functional-at-risk and were being adversely impacted by livestock grazing in the form of physical bank damage, downcutting, and/or excessive vegetation use and trampling. These springs are likely not providing suitable habitat for some or all dependent species.

Focal Special Status Species

Greater sage-grouse

Although the majority of pasture 2 contains potential sage-grouse habitat (92 percent), key habitat is limited (Table WDLF-1). The majority of potential habitat (94 percent) has

been converted to juniper woodlands or perennial grasslands as a result of 2007 Crutcher fire and is unsuitable for sage-grouse. Key sage-grouse habitat is limited to the eastern portion of pasture 2 (Map 6).

Nesting efforts within pasture 2 would likely result from sage-grouse attending lek 2O310 (Map 2). Lek 2O310 is the largest lek (i.e., maximum number of sage-grouse attending lek) within the subpopulation based on lek counts conducted over the last 5 years (Table WDLF-2).

Breeding habitat assessments were conducted in Pasture 2 in 2001 and 2009 (Figure WDLF-2). These assessments were conducted in the northeast portion of the pasture in a basin big sagebrush/Idaho fescue/bluebunch wheatgrass community that constitutes the only potentially suitable nesting habitat in this pasture that is largely dominated by low sage and western juniper. Habitat indicators differed slightly between assessments, but overall conditions have changed little over time (Tables WDLF-3 and WDLF-4). Differences between assessments may have been due to the natural variations in sampling locations. The major difference between the two assessments was in average sagebrush canopy cover, which probably accounts for the difference in the overall site evaluations (Tables WDLF-3 and WDLF-4). Perennial grasses included an abundance of Sandberg bluegrass and some cheatgrass. Decreaser grass abundance and vigor are good and forbs are fairly abundant. All sub-canopy indicators (i.e., grasses and forbs) fell within the range of suitable habitat and justify a suitable rating currently.

Table WDLF-3: Sage-grouse breeding habitat assessment (12S03W17), Castlehead-Lambert allotment, Pasture 2, 2001

Habitat Indicator	Suitable	Marginal	Unsuitable
Average Sagebrush Canopy Cover		10%	
Average Sagebrush Height		40”	
Sagebrush Growth Form		Mix spreading/columnar	
Average Grass and Forb Height	12”		
Average Perennial Grass Canopy Cover	36%		
Average Forb Canopy Cover	12%		
Preferred Forb Abundance and Diversity	Common/preferred spp. (n≥7)		
Overall Site Evaluation		**MARGINAL**	

Table WDLF-4: Sage-grouse breeding habitat assessment (12S03W17a), Castlehead-Lambert allotment, Pasture 2, 2009

Average Sagebrush Canopy Cover	18%		
Average Sagebrush Height		34”	
Sagebrush Growth Form		Mix spreading/columnar	
Average Grass and Forb Height	9”		
Average Perennial Grass Canopy Cover	34%		
Average Forb Canopy Cover	32%		
Preferred Forb Abundance and Diversity	Common/preferred spp. (n≥5)		
Overall Site Evaluation	**SUITABLE**		

One late brood-rearing habitat assessment was conducted in pasture 2 along an intermittent stream (Carter Creek) in a juniper encroachment area (Map 6). Although conversion to juniper woodlands is in an early-seral stage, the surveyors evaluated the site as unsuitable due to a scarcity of forbs and the degraded condition of the riparian site stability (Table WDLF-5). Distance to sagebrush and invading xeric species into the floodplain were also noted as contributing factors to the rating.

Table WDLF-5: Sage-grouse late brood-rearing habitat assessment (12S03W18), Castlehead Lambert Allotment, Pasture 2, 2001

Habitat Indicator	Suitable	Marginal	Unsuitable
Riparian and wet meadow plant community		Xeric plant species invading wet meadow or riparian area	
Riparian and wet meadow stability			Major erosion evident; large patches of bare ground
Forb availability			Succulent, green forbs are scarce or not available
Proximity of sagebrush cover		Sagebrush cover is in close proximity (>100 yards but <300 yards) of brood-rearing areas	
Riparian/Wet Meadow Site Evaluation			**UNSUITABLE**

Columbia spotted frog
There are no known occurrences within pasture 2.

Pygmy rabbit
No pygmy rabbit surveys have been conducted and there are no known occurrences of the species within pasture 2. Although a coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests portions of pasture 2 have a moderate

likelihood of core habitat presence, suitable sagebrush habitat is limited and loose, friable soils are restricted to areas now dominated by junipers.

Columbia River redband trout
Redband trout are not known to occupy the intermittent streams within pasture 2.

Pasture 3 – Red Basin

Upland Habitat Assessment

Approximately 85 percent of pasture 3 burned in the 2007 Crutcher fire. The 2007 fire partially occurred in an area that has burned in the past 20 years (i.e., 1991 Red Canyon). The fires have affected all upland habitat types including sagebrush steppe, mountain shrub, and juniper woodlands. In addition, all habitats have been impacted to varying degrees by juniper encroachment previous to the 2007 Crutcher fire (see the Standard 4 discussion above). Because of the mosaic nature of the burn within pasture 3, many small to large stands of mid- to late-seral juniper have persisted within the burn perimeter. Although juniper provides important habitat for some species, its encroachment into sagebrush, mountain shrub, and mahogany communities has resulted in the decline and loss of habitat for many sagebrush-obligate and shrub-dependent species.

In burned areas, recovery of perennial grasses and native forbs is apparent; however, desirable bunchgrasses (i.e., bluebunch wheatgrass, Idaho fescue) are lower than expected and shallow-rooted perennial grasses (i.e., Sandberg bluegrass) are higher than expected. Cheatgrass is scattered to common throughout the pasture and is possibly limiting the establishment of desirable grasses and forb seedlings by competing for limited soil moisture and nutrients. In addition, the absence of the essential shrub component is likely limiting use for many shrub-dependent special status species as shrubs provide nesting structure and foraging areas.

Habitat conditions within the unburned area (i.e., The Badlands) are similar to reference areas where junipers are to be expected on the area's shallow rocky soils. These juniper-speckled breaks provide important habitat for a diversity of Neotropical migratory birds, bats and other woodland-associated species.

Riparian Habitat Assessment

The majority of lotic riparian habitat assessed in pasture 3 is functioning properly (see the Standard 2 discussion above) and is expected to be providing habitat that is adequate for the needs of most special status species. The remaining assessed streams are functioning-at-risk primarily because they lack riparian vegetation that stabilizes banks and upland species are becoming established in the riparian zone. The indicators suggest that habitat in these areas is inadequate to support thriving populations of special status species and other dependent wildlife. There is also

inadequate hydric vegetation cover to protect banks and dissipate energy, leaving the area at high risk of habitat loss or degradation during high flow events.

Rattlesnake Spring is located in pasture 3 and has recently been assessed as functioning properly (see the Standard 2 discussion above). Rattlesnake Spring is expected to be providing habitat that is adequate for the needs of most dependent special status species

Focal Special Status Species

Greater sage-grouse

Although the majority of pasture 3 contains potential sage-grouse habitat (86 percent), key habitat is almost entirely absent (less than1 percent; Table WDLF-1). Due to the 2007 Crutcher fire, areas of potential habitat currently are composed of perennial grasslands (81 percent) and unburned inclusions of juniper woodlands (19 percent; Maps 3 and 6).

Breeding habitat assessments were conducted in Pasture 3 in 2001 and 2009 (13S04W09 and 13S04W09a). These assessments were conducted on Defeat Ridge in an area that was a fairly extensive big sagebrush/bluebunch wheatgrass/Idaho fescue community in 2001. However, when the site was revisited in 2009 after the 2007 Crutcher fire, no shrubs were detected and the area was dominated by perennial grasslands. Nesting within pasture 3 is highly unlikely due to the current unsuitability of the habitat.

One late brood-rearing habitat assessment was conducted in pasture 3 in 2001 along an intermittent stream (i.e., Red Basin Creek). Although the surveyors noted few forbs in the upland sagebrush community adjacent to the assessment site, the majority of riparian/wet meadow site indicators supported an overall rating of suitable habitat (Table WDLF-5). Due to the 2007 Crutcher fire, this area is miles from the nearest suitable breeding habitat; hence, current use is probably very limited.

Table WDLF-6: Sage-grouse late brood-rearing habitat assessment (13S04W08), Castlehead-Lambert Allotment, Pasture 3, 2001

Habitat Indicator	Suitable	Marginal	Unsuitable
Riparian and wet meadow plant community		Xeric plant species invading wet meadow or riparian area	
Riparian and wet meadow stability	No erosion evident; some bare ground may be evident but vegetative cover dominates the site		
Forb availability	Succulent, green forbs are readily available in terms of distribution and plant structure		
Proximity of sagebrush cover	Sagebrush cover is adjacent to brood-rearing area (<100 yards)		
Riparian/Wet Meadow Site Evaluation	**SUITABLE**		

Columbia spotted frog
Occurrence information available from the Idaho Fish and Wildlife Information System (IFWIS 2011) documents observations of spotted frogs in pasture 3. The wetland and riparian areas in the pasture are in poor condition (see Standards 2 and 3) and thus are not providing suitable habitat for the maintenance of viable populations.

Pygmy rabbit
No pygmy rabbit surveys have been conducted and there are no known occurrences of the species within pasture 3. Although a coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests that the eastern portion of pasture 3 has a moderate likelihood of core habitat presence, these areas overlap with the very shallow soils and rocky outcrops of the Badlands, are otherwise recovering from the 2007 Crutcher fire, and are dominated by perennial grasslands and junipers. Suitable loose, friable soils are limited to a thin band below the rim of Lambert Table.

Columbia River redband trout
According to the OFO, BLM fish sampling records, redband trout occupy the reaches of Red Canyon that traverse pasture 3 on a seasonal basis. These reaches often subside underground by late summer, and the fish move either upstream into the EF and WF of Red Canyon or downstream into Red Canyon. The portion of Red Canyon in pasture 3 is not in proper functioning condition (see Standards 2 and 3), and thus the stream is not providing adequate habitat conditions to maintain viable trout populations.

Pasture 4 – Lambert Table

Upland Habitat Assessment

Pasture 4 was the only pasture within the allotment that did not burn during the 2007 Crutcher fire. Sagebrush occurrence is as expected at all low sagebrush assessment sites and at all but one big sagebrush site, where it was greater than expected and is generally providing good woody cover, structure, and forage for a diversity of Neotropical migratory birds, sage-grouse, and other shrub-obligate species. Perennial forb diversity is similar to reference areas, but desirable bunchgrass occurrence is less than expected, and may be limiting effective cover for ground-nesting and -foraging species such in low sagebrush sites. Cheatgrass occurrence is greater than expected and is likely limiting the establishment of desirable grasses and forb seedlings by competing for limited soil moisture and nutrients. Junipers are very rare on Lambert Table and encroachment is currently not considered to be a significant factor in the quality of special status species habitat in this pasture.

Riparian Habitat Assessment

No significant riparian habitat (lotic or lentic) occurs in pasture 4, and no assessments have been conducted.

Focal Special Status Species

Greater Sage-grouse

The vast majority of pasture 4 contains potential sage-grouse habitat (99 percent), most of which is classified as key habitat (96 percent; Table WDLF-1). A relatively small area in the northern part of the pasture near the rim of Lambert Table is classified as juniper encroachment (Map 6).

Nesting efforts within pasture 4 would likely result from sage-grouse attending the three leks located on Lambert Table (i.e., 2O228, 2O617, 2O467; Map 6). In addition, leks 2O617 and 2O228 are two of the largest ten leks (i.e., maximum number of sage-grouse attending lek) within the subpopulation, based on lek counts conducted over the last 5 years (Table WDLF-2). Although nesting effort within pasture 4 could results from sage-grouse attending nearby leks outside the allotment (i.e., 2O465, 2O466, and 2O230; Map 2), most nesting sage-grouse are probably attending leks on Lambert Table. Because leks 2O465 and 2O466 are located south of the East Fork Owyhee River, their use of Lambert Table may be restricted by the predation risk incurred by flying over the canyon. Nesting sage-grouse attending lek 2O230 more than likely are using the abundant surrounding key habitat in the Nickel Creek allotment.

Breeding habitat assessments were conducted in Pasture 4 in 2001 and 2009. Two assessments were conducted in each year and all were conducted at distinct locations. Assessments 13S04W15 and 13S03W20 were conducted in 2001 (Tables WDLF-7 and

WDLF-8) and assessments 13S04W15a and 13S03W18 were conducted in 2009 (Tables WDLF-9 and WDLF-10).

Assessment 13S04W15 was conducted in the far western portion of the pasture in a late-seral Wyoming big sagebrush/bluebunch wheatgrass/Idaho fescue community within a landscape generally dominated by low sagebrush. Desirable perennial grass vigor, abundance and production, and forb diversity and abundance were good despite the dry conditions. The surveyors noted that the area appeared to be excellent nesting habitat. Assessment 13S03W20 was conducted at the extreme eastern edge of Lambert Table in a small Wyoming big sagebrush/bluebunch wheatgrass/Idaho fescue community within a landscape generally dominated by low sagebrush. Desirable perennial grass vigor, abundance, and production were very good, and an abundance of residual growth was noted. Desirable forb diversity and abundance were also good. The majority of habitat indicators were rated as suitable, which yielded an overall site rating of suitable.

Assessment 13S04W15a was conducted approximately 0.5 miles to the northeast of the 2001 assessment and also was in a Wyoming big sagebrush/bluebunch wheatgrass/Idaho fescue community. Although the majority of habitat indicators fell within the suitable range and desirable perennial grass cover was described as great, sagebrush cover and grass were slightly high and forb heights were slightly low (Table WDLF-9). In combination, these important indicators and a general lack of preferred forb abundance and diversity caused the surveyors to give the site an overall rating of marginal. Assessment 13S03W18 was conducted at a novel location approximately 1.8 miles to the northwest of assessment 13S03W20 in a small Wyoming big sagebrush stand with an understory of Idaho fescue/bottlebrush squirreltail; bluebunch wheatgrass and cheatgrass were also present in small amounts. Although most habitat indicators fell within the suitable range, sagebrush cover and grass and forb heights were moderately high and low, respectively (Table WDLF-10). These important indicators and a lack of preferred forb abundance and diversity caused the surveyors to give the site an overall rating of marginal.

Table WDLF-7: Sage-grouse breeding habitat assessment (13S04W15), Castlehead-Lambert Allotment, Pasture 4, 2001

Habitat Indicator	Suitable	Marginal	Unsuitable
Average Sagebrush Canopy Cover	16%		
Average Sagebrush Height		31”	
Sagebrush Growth Form	Spreading form		
Average Grass and Forb Height	13”		
Average Perennial Grass Canopy Cover	38%		
Average Forb Canopy Cover	12%		
Preferred Forb Abundance and Diversity	Common/preferred spp. (n≥8)		
Overall Site Evaluation	**SUITABLE**		

Table WDLF-8: Sage-grouse breeding habitat assessment (13S03W20), Castlehead-Lambert Allotment, Pasture 4, 2001

Habitat Indicator	Suitable	Marginal	Unsuitable
Average Sagebrush Canopy Cover	16%		
Average Sagebrush Height		35”	
Sagebrush Growth Form	Spreading form		
Average Grass and Forb Height	13”		
Average Perennial Grass Canopy Cover	42%		
Average Forb Canopy Cover	16%		
Preferred Forb Abundance and Diversity	Common/preferred spp. (n≥8)		
Overall Site Evaluation	**SUITABLE**		

Table WDLF-9: Sage-grouse breeding habitat assessment (13S04W15a), Castlehead-Lambert Allotment, Pasture 4, 2009

Habitat Indicator	Suitable	Marginal	Unsuitable
Average Sagebrush Canopy Cover		28%	
Average Sagebrush Height	25”		
Sagebrush Growth Form	Spreading form		
Average Grass and Forb Height		6”	
Average Perennial Grass Canopy Cover	16%		
Average Forb Canopy Cover	8%		
Preferred Forb Abundance and Diversity		Common/few preferred spp. (n≥4)	
Overall Site Evaluation		**MARGINAL**	

Table WDLF-10: Sage-grouse breeding habitat assessment (13S03W18), Castlehead-Lambert Allotment, Pasture 4, 2009

Habitat Indicator	Suitable	Marginal	Unsuitable
Average Sagebrush Canopy Cover		42%	
Average Sagebrush Height	22”		
Sagebrush Growth Form	Spreading form		
Average Grass and Forb Height		5”	
Average Perennial Grass Canopy Cover	12%		
Average Forb Canopy Cover	14%		
Preferred Forb Abundance and Diversity		Common/few preferred spp. (n≥2)	
Overall Site Evaluation		**MARGINAL**	

Within-year differences of habitat indicators at assessment sites were slight. However, between-year differences of habitat indicators, average grass/forb heights and canopy cover in particular were notable. Although differences in between-year assessments

may have been due to the different sampling locations and seasons (i.e., May versus July, as the data indicate), the 50-percent reduction in grass and forb cover indicate an actual reduction in this habitat indicator over time. The overall marginal ratings in 2009 appear to be warranted and habitat indicators seem to be showing an overall degradation in sage-grouse breeding habitat quality on Lambert Table.

Columbia spotted frog
IDNHP documents occurrences within pasture 4 near the Lambert Reservoir.

Pygmy rabbit
No pygmy rabbit surveys have been conducted and there are no known occurrences of the species within pasture 4. A coarse-level predictive occurrence model created by Idaho BLM in 2009 suggests that the eastern portion of pasture 4 has a moderate likelihood of core habitat presence. However, there are only are few relatively small loamy ecological sites in the eastern portion of the pasture that have suitable big sagebrush communities and loose, deep soils in a landscape of otherwise unsuitable low sagebrush communities with shallow, clayey soils.

Columbia River redband trout
Redband trout are not known to occupy the intermittent and ephemeral streams within pasture 4.

Pasture 5 – Horse

Upland Habitat Assessment

All of pasture 5 burned in the 2007 Crutcher fire. The fire has affected all upland habitat types, including sagebrush steppe and juniper woodlands. Because of the mosaic nature of the burn within pasture 5, a few small stands of mid-seral juniper have persisted within the burn perimeter. Although juniper provides important habitat for some species, its encroachment into sagebrush, mountain shrub, and mahogany communities has resulted in the decline and loss of habitat for many sagebrush-obligate and shrub-dependent species.

The recovery of perennial grasses and native forbs is apparent, but desirable bunchgrasses (i.e., bluebunch wheatgrass, Idaho fescue) are lower than expected and shallow-rooted perennial grasses (i.e., Sandberg bluegrass) are higher than expected; these conditions appear to have preceded the fire as similar observations were made during previous assessments. The absence of the essential shrub component is likely limiting use for many shrub-dependent special status species as shrubs provide nesting structure and foraging areas. Cheatgrass is scattered to common throughout the pasture and is possibly limiting the establishment of desirable grasses and forb seedlings by competing for limited soil moisture and nutrients.

Riparian Habitat Assessment

There is no significant lotic riparian habitat in pasture 5. However, there are five springs that support lentic riparian/wetland vegetation, four of which have been developed and equipped with pipelines and troughs or small catchment ponds; no information is available on the remaining spring. None of the springs are equipped with livestock exclosures. Three springs have been assessed for properly functioning condition (see the Standard 4 discussion above); one spring is functioning properly and is supporting habitat that appears to be adequate to provide for the needs of most dependent special status species. The remaining two springs assessed were rated as functional-at-risk or non-functional and appeared to have been adversely affected by livestock use and are not likely providing habitat adequate for the needs of most dependent special status species.

Focal Special Status Species

Greater sage-grouse
Although the majority of pasture 5 contains potential sage-grouse habitat (98 percent), key habitat is absent (Table WDLF-1). Due to the 2007 Crutcher fire, areas of potential habitat currently are composed of perennial grasslands (89 percent) and unburned inclusions of juniper woodlands (11 percent; Maps 3 and 6). No breeding or brood-rearing habitat assessments have been conducted in pasture 5.

Columbia spotted frog
IDNHP documents occurrences within pasture 5 in and around the Rattlesnake Spring exclosure. Where wetland areas are exclosed from livestock, there are areas of suitable habitat. However, the areas not excluded along with the riparian areas associated with the streams in the pasture are in poor condition (see Standards 2 and 3) and are providing marginal spotted frog habitat.

Pygmy rabbit
No pygmy rabbit surveys have been conducted and there are no known occurrences of the species within pasture 5. Although a coarse-level predictive occurrence model created by Idaho BLM in 2009 shows that the eastern half of pasture 5 is at the periphery of an area with a moderate likelihood of core habitat presence, suitable big sagebrush habitat is lacking throughout due to the 2007 Crutcher fire.

Columbia River redband trout
Redband trout are not known to occupy the intermittent and ephemeral streams within pasture 5.

Pasture 6 – Between-the-Canyons

Upland Habitat Assessment

Approximately 40 percent of pasture 6 burned in the 2007 Crutcher fire. Effects of the fire are evident throughout the pasture, although many small to large patches of juniper woodland remain intact within the fire perimeter. The fire affected all upland habitat types, including sagebrush steppe, mountain shrub, mahogany savanna, and juniper woodlands. Functionally and structurally intact shrub communities are very limited, as all unburned habitats have been impacted by varying degrees of juniper encroachment (see the Standard 4 discussion above). In these areas, a diversity of forbs and grasses are present, but desirable bunchgrass that provide nesting cover and forage for many shrub-associated species are decreasing, while shorter statured perennial grasses like Sandberg bluegrass are increasing. These conditions are probably limiting cover for ground-nesting and -foraging birds and are not providing adequate habitat needs for most shrub-associated special status wildlife species. In burned areas, perennial grasses and native forbs are similar to reference conditions; however, the absence of the essential shrub component is likely limiting use for many shrub-dependent special status species, as shrubs provide nesting structure and foraging areas.

As previously discussed, western juniper is common to dominant throughout most of pasture 6, and while this species provides important habitat for a diversity of neotropical migratory birds, bats and other species, its encroachment into sagebrush, mountain shrub, and mahogany communities is resulting in the decline and/or loss of habitat for many sagebrush-obligate and shrub-dependent species.

Riparian Habitat Assessment

The majority of lotic riparian habitat assessed in pasture 2 is functioning-at-risk, while the remainder is functioning properly (see Standard 2 discussion above). Generally, stream reaches that are inaccessible to livestock are functioning properly. The quality and quantity of shade, nesting habitat, forage, escape cover, and prey abundance are reduced in the functioning-at-risk stream reaches. Excessive vegetation utilization by livestock in these stream reaches, along with associated physical disturbance, is also directly affecting habitats and possibly populations of dependent special status species by reducing cover and forage and exposing nests, eggs, and young to predation and the elements. There is also inadequate hydric vegetation cover to protect banks and dissipate energy in the large majority of the stream reaches. These reaches have a high risk of habitat loss or degradation during high flow events.

Lentic riparian/wetland vegetation is supported at many springs within pasture 2 (see the Standard 2 discussion above). The majority of these springs are supporting habitat that appears to be adequate to provide for the needs of most dependent special status species because they have been developed and excluded from livestock or are simply receiving limited livestock use. Some springs have received excessive levels of livestock use and/or have been significantly altered by the construction of

impoundments, which has resulted in reduced cover, forage, possible reductions in insect and other prey abundance, reduced water quality, and increased physical disturbance that can result in the direct destruction of nests, eggs, and young, and increased exposure of eggs and young to predation and the elements. Additionally, some springs were not visited or have inadequate information recorded to fully assess their condition.

Focal Special Status Species

Greater sage-grouse
Potential sage-grouse habitat is limited to the southern two thirds of pasture 6 (Map 6). This portion of the pasture is located below one of the highest benches that are radially arranged around the summit of Juniper Mountain. Currently, dense juniper woodlands occur above and on the steep bench slopes in areas of non-habitat. More than likely, these areas do not support sage-grouse habitat because junipers are expected on the steep rocky bench slopes under natural conditions and disturbance regimes, and the juniper woodlands currently dominant on the broad prominence of the Juniper Mountain summit have replaced the mahogany savanna ecological site conditions, which in that setting, would not have supported sage-grouse habitat. The steep rocky canyons of the East and West Fork of Red Canyon comprise the remaining areas of non-habitat within pasture 6.

Currently, key sage-grouse habitat does not occur in pasture 6 and no sage-grouse breeding habitat assessments have been conducted. The majority of potential sage-grouse habitat in pasture 6 is composed of perennial grasslands (54 percent) that resulted from the 2007 Crutcher fire (Table WDLF-1). The remaining potential habitat has been converted to juniper woodlands (46 percent). Even though the fire killed several hundred acres of juniper within this area, decay of the juniper snags and recovery of the mountain sagebrush community and sage-grouse habitat may take at least 70 years (Baker 2006).

One late brood-rearing habitat assessment was conducted in pasture 6 at a wet meadow site (i.e., East Spring) above the high bench in a non-habitat area. Although the site was rated as marginal, its location within a non-habitat area surrounded by dense juniper woodlands effectively renders it unsuitable, and therefore will not be discussed further.

Columbia spotted frog
There are no known occurrences within pasture 6.

Pygmy rabbit
No pygmy rabbit surveys have been conducted and there are no known occurrences of the species within pasture 6. Although a coarse-level predictive occurrence model created by Idaho BLM in 2009 shows that the eastern third of pasture 6 is at the periphery of an area with a moderate likelihood of core habitat presence, suitable big sagebrush habitat is lacking throughout due to the 2007 Crutcher fire.

Columbia River redband trout
According the IDFG fisheries database, redband trout are known to occupy the EF and WF of Red Canyon in pasture 6. The majority of the trout habitat in pasture 6 is not in proper functioning condition (see Standards 2 and 3), and thus the streams are not providing adequate habitat conditions to maintain viable trout populations.

Evaluation of Standard 8 (Plants and Wildlife)

Evaluation Finding – allotment is (check one):
____ Meeting the Standard
___ Not meeting the Standard, but making significant progress toward meeting
_X_ Not meeting the Standard

RMP Objectives/Desired Conditions:

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.

Management Actions and Allocations:

1. Prepare, revise, and implement Habitat Management Plans (HMPs) and other resource activity plans and cooperate in the development and implementation of Recovery Plans, Conservation Agreements and Strategies and species management plans to ensure that objectives for special status plant and animal species are incorporated and met.

2. Limit the adverse impacts of various land use activities, management actions and land tenure adjustments to special status plant and animal species populations and habitats through implementation of management actions identified in objectives FORS 2, WHRS 1, LVST 1, FIRE 1-4, LAND 1-6, LOCM 1, FLUM 1, MMAT 1, RECT 1 and HAZM 1. To limit adverse impacts, fencing of populations and their habitats will occasionally be required.

3. Protect and enhance habitat for a diversity of special status species through implementation of management actions identified in objectives SOIL 1 and 2, WATR 1 and 2, VEGE 1, RIPN 1, FORS 1 and 2, WDLF 1, FISH 1 and 2, RECT 3, WNES 1 and 2, HAZM 1 and ACEC 1.

9. Identify, protect and enhance key sage-grouse habitats and populations. Guidance for enhancement and protection is addressed in the Memorandum of Agreement in the 1997 Idaho Sage-grouse Management Plan (March 1998). Subsequent guidance may become available through development of plans by local sage-grouse working groups or similar efforts.

10. Protect and enhance California bighorn sheep habitat and populations within the boundaries of Owyhee River Bighorn Sheep Habitat Area ACEC through continued implementation of the ACEC Management Plan.

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 populations of wildlife.

Management Actions and Allocations:

1. Ensure that all activity plans include objectives for maintaining or enhancing habitat for those wildlife species known or likely to occur within the planning area.

2. Limit the adverse impacts of various land use activities, management actions and land tenure adjustments to wildlife populations and habitats through implementation of management actions identified in objectives FORS 2, WHRS 1, LVST 1, FIRE 1-4, LAND 1-6, LOCM 1, FLUM 1, MMAT 1, RECT 1 and HAZM 1.

3. Protect and enhance habitat for a diversity of wildlife through implementation of management actions identified in objectives SOIL 1 and 2, WATR 1 and 2, VEGE 1, RIPN 1, FORS 1 and 2, FISH 1 and 2, RECT 3, WNES 1 and 2, HAZM 1 and ACEC 1.

4. Adjust overall grazing management practices to ensure that adequate upland forage and cover remains to accommodate the needs of wildlife. Specifically:
   - limit utilization of key browse species, as measured in the fall, to a maximum of 30 percent within all deer winter habitat and 50 percent within all other habitats.

   - limit utilization of key upland herbaceous forage species to a maximum of 50 percent at the time of livestock removal from a pasture.

   More restrictive utilization standards may be imposed where necessary to accomplish specific wildlife or other resource objectives.

8. Minimize barriers to big game movement by constructing new fences and modifying existing fences to meet or exceed Boise District Fence Policy standards for the species present.

9. Protect and enhance habitat for wildlife at all developed springs and selected undeveloped springs, wet meadows, reservoirs and stream riparian reaches by fencing to exclude livestock. Close all exclosures to livestock grazing for the life of this plan except where it is determined that controlled grazing is necessary to achieve a specific resource objective.

12. Protect raptor nests and manage adjacent vegetation to ensure adequate habitat for prey species. Authorize no human caused disturbance within a 0.5 mile radius of any known golden eagle nest between February 1 and June 30 and other species' nests between March 15 and June 30. Disturbance is defined as any activity which could result in frequent flushing of adults or young, nest abandonment or significant loss of prey base.

Rationale for Evaluation Finding

Plants

The thinleaf goldenthread site has not been revisited since the pasture 1 division fence was installed and, thus, it is unclear the effects of the fence project and the current grazing management regime on this population. However, actual use reports from 1986 to 2010 (1987, 2002-2004 missing) showed Castlehead pasture grazing use was deferred every year until after the active growing season, generally beginning no earlier than July 1. Of the actual use reported, 28 percent have an on-date from June 8th to July 10th, which may overlap with flowering if seasonal weather conditions are delayed. In addition, with the rough terrain and the sinuous fenceline that was proposed, cattle are not as likely to trail directly along the fence.

While livestock grazing effects at the thinleaf goldenhead site are unknown, it can be reasonably deduced that the current livestock grazing management is having little to no influence on this population. Observations on mountain ball cactus sites indicate no known effects from current livestock grazing due to the lack of vegetation and rocky nature typical of the habitat which detract livestock congregation, trailing or herbivory. While this Standard is being met for plants, overall the Standard is not being met, due to wildlife (see below).

Wildlife

Castlehead-Lambert allotment is making significant progress toward meeting Standard 8 for wildlife in upland habitats. However, Standard 8 is not being met for wildlife in riparian/wetland habitats, due to a lack of hydric vegetation and soil instability along streambanks and in wet meadows (see the Standard 2 discussion above). Typically, for the reaches of stream that are not in proper functioning condition, there is inadequate riparian-wetland vegetation present to protect streambanks and dissipate energy during high flows, and plant communities are often not comprised of deep-rooted bank stabilizing hydric species. Riparian areas in particular are likely not providing adequate nesting structure and cover for dependent species within the allotment due to a lack of woody species such as willows and aspen. In addition, current degraded riparian/wetland conditions are probably limiting late-brood rearing habitat use by sage-grouse in otherwise suitable landscape settings.

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APPENDIX A: IDAHO STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR LIVESTOCK GRAZING MANAGEMENT

Standards for Rangeland Health

Introduction

The Standards for Rangeland Health, as applied in the State of Idaho, are to be used as the Bureau of Land Management's management goals for the betterment of the environment, protection of cultural resources, and sustained productivity of the range. They are developed with the specific intent of providing for the multiple use of the public lands. Application of the standards should involve collaboration between the authorized officer, interested publics, and resource users.

Rangelands should be meeting the Standards for Rangeland Health or making significant progress toward meeting the standards. Meeting the standards provides for proper nutrient cycling, hydrologic cycling, and energy flow.

Monitoring of all uses is necessary to determine if the standards are being met. It is the primary tool for determining rangeland health, condition, and trend. It will be performed on representative sites.

Appropriate to soil type, climate, and landform, indicators are a list of typical physical and biological factors and processes that can be measured and/or observed (e.g., photographic monitoring). They are used in combination to provide information necessary to determine the health and condition of the rangelands. Usually, no single indicator provides sufficient information to determine rangeland health. Only those indicators appropriate to a particular site are to be used. The indicators listed below each standard are not intended to be all inclusive.
The issue of scale must be kept in mind in evaluating the indicators listed after each standard. It is recognized that individual isolated sites within a landscape may not be meeting the standards; however, broader areas must be in proper functioning condition. Furthermore, fragmentation of habitat that reduces the effective size of large areas must also be evaluated for its consequences.

Standard 1 (Watersheds)

Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, vegetation, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include, but are not limited to, the following:

1. The amount and distribution of ground cover, including litter, for identified ecological site/s) or soil-plant associations are appropriate for site stability.

2. Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/surface sealing, and compaction layers below the soil surface is minimal for soil type and landform.

Standard 2 (Riparian Areas and Wetlands)
Riparian-wetland areas are in properly functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include, but are not limited to, the following:

1. The riparian/wetland vegetation is controlling erosion, stabilizing streambanks, shading water areas to reduce water temperature, stabilizing shorelines, filtering sediment, aiding in floodplain development, dissipating energy, delaying flood water, and increasing recharge of groundwater appropriate to site potential.

2. Riparian/wetland vegetation with deep strong binding roots is sufficient to stabilize streambanks and shorelines. Invader and shallow rooted species are a minor component of the floodplain.

3. Age class and structural diversity of riparian/wetland vegetation is appropriate for the site.

4. Noxious weeds are not increasing.

Standard 3 (Stream Channel/Floodplain)
Stream channels and floodplains are properly functioning relative to the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity) and climate to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include, but are not limited to, the following:

1. Stream channels and floodplains dissipate energy of high water flows and transport sediment. Soils support appropriate riparian-wetland species, allowing water movement, sediment filtration, and water storage. Stream channels are not entrenching.

2. Stream width/depth ratio, gradient, sinuosity, and pool, riffle and run frequency are appropriate for the valley bottom type, geology, hydrology, and soils.

3. Streams have access to their floodplains and sediment deposition is evident.

4. There is little evidence of excessive soil compaction on the floodplain due to human activities.

5. Streambanks are within an appropriate range of stability according to site potential.

6. Noxious weeds are not increasing.

Standard 4 (Native Plant Communities)
Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

Indicators may include, but are not limited to, the following:

1. Native plant communities (flora and microbiotic crusts) are maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant species.

2. The diversity of native species is maintained.

3. Plant vigor (total plant production, seed and seedstalk production, cover, etc.) is adequate to enable reproduction and recruitment of plants when favorable climatic events occur.

4. Noxious weeds are not increasing.

5. Adequate litter and standing dead plant material are present for site protection and for decomposition to replenish soil nutrients relative to site potential.

Standard 5 (Seedings)
Rangelands seeded with mixtures, including predominately non-native plants, are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.

Indicators may include, but are not limited to, the following:

1. In established seedings, the diversity of perennial species is not diminishing over time.

2. Plant production, seed production, and cover are adequate to enable recruitment when favorable climatic events occur.

3. Noxious weeds are not increasing.

4. Adequate litter and standing dead plant material are present for site protection and for decomposition to replenish soil nutrients relative to site potential.

Standard 6 (Exotic Plant Communities, other than Seedings)
Exotic plant communities, other than seedings, will meet minimum requirements of soil stability and maintenance of existing native and seeded plants. These communities will be rehabilitated to perennial communities when feasible cost effective methods are developed.

Indicators may include, but are not limited to, the following:

1. Noxious weeds are not increasing.

2. The number of perennial species is not diminishing over time.

3. Plant vigor (production, seed and seedstalk production, cover, etc.) of remnant native or seeded (introduced) plants is maintained to enable reproduction and recruitment when favorable climatic or other environmental events occur.

4. Adequate litter and standing dead plant material is present for site protection and for decomposition to replenish soil nutrients relative to site potential.

Standard7 (Water Quality)
Surface and ground water on public lands comply with the Idaho Water Quality Standards.

Indicators may include, but are not limited to, the following:

1. Physical, chemical, and biologic parameters described in the Idaho Water Quality Standards.

Standard 8 (Threatened and Endangered Plants and Animals)
Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.

Indicators may include, but are not limited to the following:

2. Parameters described in the Idaho Water Quality Standards.

3. Riparian/wetland vegetation with deep, strong, binding roots is sufficient to stabilize streambanks and shorelines. Invader and shallow rooted species are a minor component of the floodplain.

4. Age class and structural diversity of riparian/wetland vegetation are appropriate for the site.

5. Native plant communities (flora and microbiotic crusts) are maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant species.

6. The diversity of native species is maintained.

7. The amount and distribution of ground cover, including litter, for identified ecological site(s) or soil-plant associations are appropriate for site stability.

8. Noxious weeds are not increasing.

Guidelines for Livestock Grazing Management

Introduction
Guidelines 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. 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. Livestock grazing management practices and guidelines will be consistent with the Idaho Agricultural Pollution Abatement plan.

Grazing management practices and facilities are implemented locally, usually on an allotment or watershed basis. Grazing management programs are based on a combination of appropriate grazing management practices and facilities developed through consultation, coordination, and cooperation with the Bureau of Land Management, permittees, other agencies, Indian tribes, and interested publics.

These guidelines were prepared under the assumption that regulations and policies regarding grazing on the public lands will be implemented and will be adhered to by the grazing permittees and agency personnel. Anything not covered in these guidelines will be addressed by existing laws, regulations, Indian treaties, and policies.

The BLM will identify and document within the local watershed all impacts that affect the ability to meet the standards. If a standard is not being met due to livestock grazing, then allotment management will be adjusted unless it can be demonstrated that significant progress toward the standard is being achieved. This applies to all subsequent guidelines.

Guidelines

1. Use grazing management practices and/or facilities to maintain or promote significant progress toward adequate amounts of ground cover [determined on an ecological site basis) to support infiltration, maintain soil moisture storage, and stabilize soils.

2. Locate livestock management facilities away from riparian areas wherever they conflict with achieving or maintaining riparian-wetland functions.

3. Use grazing management practices and/or facilities to maintain or promote soil conditions that support water infiltration, plant vigor, and permeability rates and minimize soil compaction appropriate to site potential.

4. Implement grazing management practices that provide periodic rest or deferment during critical growth stages to allow sufficient regrowth to achieve and maintain healthy, properly functioning conditions, including good plant vigor and adequate vegetative cover appropriate to site potential.

5. Maintain or promote grazing management practices that provide sufficient residual vegetation to improve, restore, or maintain healthy riparian-wetland functions and structure for energy dissipation, sediment capture, ground water recharge, streambank stability, and wildlife habitat appropriate to site potential.

6. The development of springs, seeps, or other projects affecting water and associated resources shall be designed to protect the ecological functions, wildlife habitat, and significant cultural and historical/ archaeological/paleontological values associated with the water source.

7. Apply grazing management practices to maintain, promote, or progress toward appropriate stream channel and streambank morphology and functions. Adverse impacts due to livestock grazing will be addressed.

8. Apply grazing management practices that maintain or promote the interaction of the hydrologic cycle, nutrient cycle, and energy flow that will support the appropriate types and amounts of soil organisms, plants, and animals appropriate to soil type, climate, and landform.

9. Apply grazing management practices to maintain adequate plant vigor for seed production, seed dispersal, and seedling survival of desired species relative to soil type, climate, and landform.

10. Implement grazing management practices and/or facilities that provide for complying with the Idaho Water Quality Standards.

11. Use grazing management practices developed in recovery plans, conservation agreements, and Endangered Species Act, Section 7 consultations to maintain or improve habitat for federally listed threatened, endangered, and sensitive plants and animals.

12. Apply grazing management practices and/or facilities that maintain or promote the physical and biological conditions necessary to sustain native plant populations and wildlife habitats in native plant communities.

13. On areas seeded predominantly with non-native plants, use grazing management practices to maintain or promote the physical and biological conditions to achieve healthy rangelands.

14. Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Native species are emphasized for rehabilitating disturbed rangelands. Evaluate whether native plants are adapted, available, and able to compete with weeds or seeded exotics.

15. Use non-native plant species for rehabilitation only in those situations where:

a. native species are not readily available in sufficient quantities;

b. native plant species cannot maintain or achieve the standards; or

c. non-native plant species provide for management and protection of native rangelands.

Include a diversity of appropriate grasses, forbs, and shrubs in rehabilitation efforts.[10]

16. On burned areas, allow natural regeneration when it is determined that populations of native perennial shrubs, grasses, and forbs are sufficient to revegetate the site. Rest burned or rehabilitated areas to allow recovery or establishment of perennial plant species.

17. Carefully consider the effects of new management facilities (e.g., water developments, fences) on healthy and properly functioning rangelands prior to implementation.

18. Use grazing management practices, where feasible, for wildfire control and to reduce the spread of targeted undesirable plants (e.g., cheatgrass, medusa head, wildrye, and noxious weeds) while enhancing vigor and abundance of desirable native or seeded species.

19. Employ grazing management practices that promote natural forest regeneration and protect reforestation projects until the Idaho Forest Practices Act requirements for timber stand replacement are met.

20. Design management fences to minimize adverse impacts, such as habitat fragmentation, to maintain habitat integrity and connectivity for native plants and animals.

[10] An apparent editing mistake with numbering the 1997 Idaho guidelines was carried forward in this appendix to avoid misidentifying specific guidelines.

APPENDIX B: METHODS

This section describes methods used to collect data for this assessment. Resources of interest, as identified by the Idaho Rangeland Health Standards and Guidelines, are assessed to determine whether they are meeting, or making significant progress toward meeting the Standards. The information collected includes data that enables an Interdisciplinary Team (ID Team) to analyze the condition of upland and riparian areas, as well as habitat for wildlife species and areas of concern for special status plants.

Uplands

Rangeland Health Assessments -Rangeland Health Evaluation Summary Worksheets (RHE), outlined in *BLM technical reference* 1734-6 *Interpreting Indicators of Rangeland Health,* and other available qualitative and quantitative data are used to determine if rangelands are meeting or making significant progress toward meeting the Standards for Rangeland Health.

The rangeland health evaluation summary worksheet consists of 17 indicators, each of which is rated on the degree of departure from the appropriate ecological site description or ecological reference area. Areas without a nearby reference site are evaluated using the appropriate ecological site description, familiarity of the area, and incorporating the best professional judgment of the evaluators. The 17 indicators, from the summary worksheet, are compiled into three interlocking attribute categories representing soil/site stability, hydrologic function, and biotic integrity. The preponderance of evidence of each attribute determines the condition of the site.

Nested Plot Frequency and Photo Plots -Nested Plot Frequency Transect (NPFT) data provide insight into changes in the plant community, such as plant occurrence, vigor, and/or health. NPFT data are collected at permanently located study' sites and includes; species frequency, cover data, as well as shrub density where applicable. The methodology used to establish and collect data at these sites is described in detail in *BLM technical references 1400-4* and *1730-1.*

Frequency data shows changes in the occurrence of plants. Additional phenological information and photographs provides information on the reproductive capabilities of plants. Cover data describes the percent of ground covered by plant material, biological soil crusts, gravel, rock, and plant litter.

Photographs are taken at NPFT sites as well as photo plot sites. A minimum of three photographs are taken, two general landscape views and one close-up of the photo plot. Additionally, the photo plot is sketched to help illustrate species composition, size, and vigor, and is used to help corroborate the photograph.

Shrub density is collected when shrubs are present, in either 1/100th or 1/200th acre plots, depending on shrub distribution, and calculated and expressed as plants per acre.

Utilization - Utilization data is important in evaluating the effects of grazing and browse on specific areas of rangeland. Utilization refers to the percentage of forage that has been removed by animals during the grazing period. It is expressed as a percentage, and can characterize the amount of use on vegetation in an area or the use of individual plant species. Generally, utilization data are collected on transects located at pre-selected key use areas, such as permanently located study sites, although utilization may be collected at appropriate sites throughout a pasture or allotment.

Numerous methods are available for measuring utilization, some of which include: the Landscape Appearance Method, Key Species Method, Grazed Class Method, Cole Browse Method or Extensive Browse Method *(Interagency Technical Reference 1996 BLM/RS/ST-96/004+1730).* In general, the utilization data used in this assessment were collected using the Key Species Method and the Cole Browse Method.

Riparian/Wetland - A Standard Checklist, outlined in the 1998 BLM *Technical Reference* 1737-15, *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (flowing water), and other available qualitative and quantitative data are used to determine if riparian areas are meeting Rangeland Health Standards.

The standard checklist consists of 17 indicators that are used to assess the functioning condition of riparian areas. The indicators are compiled into three interlocking attribute categories representing erosion/deposition, hydrologic function, and vegetative status. Status of noxious weeds is also considered when evaluating riparian health.

Spring wetland areas were assessed for proper functioning condition as outlined in *Technical Reference* 1737-11, *"Process for assessing proper functioning condition for lentic riparian-wetland areas"* (USDI-BLM 1994). Lentic areas are defined as wetland-riparian areas adjacent to standing water habitats such as lakes, ponds, seeps, and meadows.

Special Status Species

Wildlife
Special status animal populations are continually tracked by BLM field office staff and the Idaho Natural Heritage Program (IDNHP) through the Idaho Fish and Wildlife Information System (IFWIS). BLM databases and hard copy files and IFWIS were referred to for occurrences of special status animal species.

Upland special status species habitats were assessed primarily by using the same data that was used to assess native plant communities under Standard 4. Indicators of upland habitat structure and functionality include abundance, diversity, vigor, production, cover, utilization, trend, and the occurrence of noxious and invasive plants.

Riparian special status species habitats were assessed primarily using information presented in Standard 2. While there is no direct correlation between stream functioning

condition and special status species habitat, many of the indicators of riparian functionality are also crucial components of habitat for many of the special status and other wildlife species dependent on this habitat type, especially redband trout and Neotropical migratory birds and amphibians. The indicators that assess structure, composition and vigor of hydric (riparian) vegetation are especially important because they also assess the quality and quantity of shade, nesting/breeding habitat, forage, and escape cover.

Greater sage-grouse breeding and brood-rearing habitat assessments were conducted using methodology described in the draft document "*A Framework to Assist in Making Sensitive Species Habitat Assessments for BLM-Administered Public Lands in Idaho*" (USDI-BLM 2001), primarily as a means of evaluating the suitability of the assessment areas as habitat for sage-grouse. Although this methodology specifically addresses the habitat requirements of sage-grouse, it is also useful in assessing the general health of sagebrush steppe ecosystems and their suitability as habitat for a diversity of other dependent special status species.

Botany **-**Special status plant populations are tracked by both the BLM and the Idaho Natural Heritage Program (INHP). BLM databases, and files and INHP databases are consulted for known occurrences of special status plants. Additional inventories are conducted on an ongoing basis for range projects. Monitoring of known populations occurs as time and staff allow.

APPENDIX C: TREND

A note on statistical methods:
In the past, apparently Chi Square analysis was used to compare means between years. This statistical approach is not appropriate because Chi Square assumes independent random sampling within a population each year. That is not the case with repeated measurements of fixed transect lines.

A paired Student's T test addresses this requirement. An analysis of variance (ANOVA) or a regression analysis could be useful for determining trends across multiple years. However, these methods are generally appropriate for sample sizes of ten or more; our four (or 5) years of data are not enough to show a meaningful trend using this method. The Student's T test assumes that the two populations sampled have similar variances, and samples for each mean are normally distributed. For this analysis, these parameters were assumed, but not tested.

Frequency:
At each site and for each species, the total number of hits for the 20 quadrats per belt was used as the sampling unit, providing an $n = 5$ for each site/species/year combination. The largest plot size (plot 4, 50 cm x 50 cm) of the nested frequency set was used for each species. The five samples per site were averaged and the standard deviation calculated. Then a paired, two-tailed Student's T test was run to determine whether the difference between the means of two adjacent sampling years (i.e. 1988 to 1995 and 2007 to 2011) was significantly different at $p < 0.1$.

Ground Cover:
Ground cover was compared between 1986 and 2011 for pasture 1, 1984 and 2011 for pasture 2, and 1988 to 2011 for pastures 3 and 4 at the revisited trend sites. Ground cover is recorded as a point intercept for 80 points at each of the five belts, resulting in 400 hits per site. Paired, two-tailed Student's T tests were calculated on the mean percentages of each belt.

Shrub and Tree Density:
Shrub and tree densities were counted in two 0.01-acre plots at each monitoring site. No statistical tests were run on these data since only two samples per site were taken. Similar to the frequency data, juniper (in either the mature or seedling class) were too uncommon in the density plots to reliably show trend. It appears that the monitoring sites specifically avoided dense juniper areas, so the density values shown probably do not represent juniper density across the allotment.

Pasture 1 – Castlehead

Frequency Table Statistics

- T-test Using # Hits (not % frequency)
- For years in which a species was not encountered but had been encountered in previous years, data values were entered as zeros. (Data values for species not encountered in a given year but encountered in later years were not entered as zeros since many plants were intentionally not recorded in previous years, i.e. annuals.)
- Most of the pre-1995 data were taken from old data reports, not access reports.
- A p-value <0.1 indicates a statistically significant difference.

Table C-1: Pasture 1 grasses and shrubs

11S04W27 - Bulbous Bluegrass (POBU), Plot 4				
Belt	***1986***	***1995***	***2001***	***2011***
1			0	9
2			1	9
3			0	10
4			0	9
5			0	15
Average			0.2	10.4
S			0.4472	2.6077
p				0.0012

11S04W27 - Idaho Fescue (FEID), Plot 4				
Belt	***1986***	***1995***	***2001***	***2011***
1	11	14	15	12
2	12	17	17	9
3		16	18	14
4	9	18	15	11
5	14	17	16	13
Average	11.5	16.4	16.2	11.8
S	2.0817	1.5166	1.3038	1.9235
p		0.0385	0.8276	0.0090

11S04W27 - Bluebunch Wheatgrass(AGSP), Plot 4				
Belt	***1986***	***1995***	***2001***	***2011***
1	1	1	1	6
2	0	0	0	0
3		1	1	2
4	3	1	1	3
5	1	0	0	0
Average	1.25	0.6	0.6	2.2
S	1.2583	0.5477	0.5477	2.4900
p		0.2152	1.0000	0.1596

11S04W27 - Sandberg Bluegrass (POSA3), Plot 4				
Belt	***1986***	***1995***	***2001***	***2011***
1	14	14	14	17
2	13	7	19	15
3		12	17	14
4	14	12	16	11
5	17	14	20	16
Average	14.5	11.8	17.2	14.6
S	1.7321	2.8636	2.3875	2.3022
p		0.1152	0.0496	0.1443

11S04W27 – Squirreltail (SIHY), Plot 4				
Belt	***1986***	***1995***	***2001***	***2011***
1	6	11	8	2
2	9	6	3	2
3		11	8	6
4	13	7	11	9
5	8	8	7	5
Average	9	8.6	7.4	4.8
S	2.9439	2.3022	2.8810	2.9496
p		0.6986	0.4263	0.0406

SHRUBS										
						Note: ARTRW, not ARAR8, marked in 1986.				
11S04W27 - Antelope Bitterbrush (PUTR2), Plot 4						***11S04W27 - Low Sagebrush (ARAR8), Plot 4***				
Belt	***1986***	***1995***	***2001***	***2011***		***Belt***	***1986***	***1995***	***2001***	***2011***
1	1	0	1	1		***1***	0	9	6	0
2	0	0	0	0		***2***	0	9	7	0
3		2	1	0		***3***		5	8	0
4	0	0	0	0		***4***	0	2	5	0
5	0	0	0	0		***5***	0	8	6	0
Average	0.25	0.4	0.4	0.2		***Average***	0	6.6	6.4	0
S	0.5000	0.8944	0.5477	0.4472		***S***	1.0000	3.0496	1.1402	1.0000
p		0.3910	1.0000	0.3739		***p***		0.0253	0.8868	0.0002

Ground Cover by Percentage

- Although they appear to be similar, data collection methods for years recorded in the access reports may be different than those conducted for 1989.
- Total Vegetation" and "Canopy Cover" cannot be determined from old data reports.
- A p-value <0.1 is significant.
- Long- term 1989-2009 reflects comparison between first and last monitored year (values <0.1 are significant).

Table C-2: Pasture 1 ground cover

	Fire July 2007 burned vegetation in plot.										
Bare Ground Under "bare ground" intsp+cpy	***11S04W27 - Bare Ground, Plot 4, %***					***Non-Persistent Litter*** Under "nonper litter" instp+cpy	***11S04W27 - Non-Persistent Litter, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***		***Belt***	***1986***	***1995***	***2001***	***2011***
	1	21.25	57.5	52.5	41.25		***1***	32.5	18.75	22.5	52.5
	2	36.25	45	45	36.25		***2***	30	16.25	36.25	45
	3		51.25	27.5	43.75		***3***		27.5	31.25	43.75
	4	21.25	46.25	43.75	51.25		***4***	28.75	28.75	25	35
	5	28.75	52.5	31.25	31.25		***5***	33.75	23.75	38.75	52.5
	Avg	26.88	50.5	40	40.75		***Avg***	31.25	23	30.75	45.75
	S	7.1807	5.0467	10.3456	7.5829		***S***	2.2822	5.4199	6.9933	7.2672
	p		0.0254	0.1026	0.8902		***p***		0.0632	0.144	0.0176
	Long-term 1986-2011				**0.1646**		**Long-term 1984-2011**				**0.0169**
Basal Vegetation Under "vegetation" Shrub +intsp+cpy	***11S04W27 - Basal Vegetation, Plot 4, %***					***Total Vegetation*** "Vegetation"+a sections	***11S04W27 - Total Vegetation, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***		***Belt***	***1986***	***1995***	***2001***	***2011***
	1	11.25	7.5	7.5	2.5		***1***			17.5	2.5
	2	18.75	12.5	5	13.75		***2***			20	13.75
	3		7.5	8.75	8.75		***3***			28.75	8.75
	4	15	11.25	8.75	5		***4***			33.75	5
	5	15	8.75	8.75	3.75		***5***			25	3.75
	Avg	15	9.5	7.75	6.75		***Avg***			25	6.75

	Fire July 2007 burned vegetation in plot.				
Bare Ground Under "bare ground" intsp+cpy	***11S04W27 - Bare Ground, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***
	1	21.25	57.5	52.5	41.25
	2	36.25	45	45	36.25
	3		51.25	27.5	43.75
	4	21.25	46.25	43.75	51.25
	5	28.75	52.5	31.25	31.25
	Avg	26.88	50.5	40	40.75
	S	7.1807	5.0467	10.3456	7.5829
	p		0.0254	0.1026	0.8902
	Long-term 1986-2011				**0.1646**
	S	3.0619	2.2707	1.6298	4.5586
	p		0.0062	0.3251	0.7205
	Long-term 1986-2011				**0.0075**
Gravel Rock Persistent Litter Biological Crust Under "per litter", "cryptogams "gravel", and "stones" (all) insp+(all) cpy	***11S04W27 - GR, RK, PL, CR, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***
	1	35	16.25	17.5	3.75
	2	15	26.25	13.75	5
	3		13.75	32.5	3.75
	4	35	13.75	22.5	8.75
	5	22.5	15	21.25	12.5
	Avg	26.875	17	21.5	6.75
	S	9.8689	5.2738	7.0378	3.8120
	p		0.3082	0.4289	0.0159
	Long-term 1986-2011				**0.0390**

Non-Persistent Litter Under "nonper litter" instp+cpy	***11S04W27 - Non-Persistent Litter, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***
	1	32.5	18.75	22.5	52.5
	2	30	16.25	36.25	45
	3		27.5	31.25	43.75
	4	28.75	28.75	25	35
	5	33.75	23.75	38.75	52.5
	Avg	31.25	23	30.75	45.75
	S	2.2822	5.4199	6.9933	7.2672
	p		0.0632	0.144	0.0176
	Long-term 1984-2011				**0.0169**
	S			6.5551	4.5586
	p				0.0080
Canopy Cover Add all cpy	***11S04W27 - Canopy Cover, Plot 4, %***				
	Belt	***1986***	***1995***	***2001***	***2011***
	1			10	0
	2			15	0
	3			25	0
	4			25	0
	5			16.25	0
	Avg			18.25	0
	S			6.590	0.0000
	p				0.0035

NOTE: Data for 1986 and 1995 taken from old data reports.

Shrub and Tree Density

- Plants/acre from mean of two plots.
- X = Seedling.

Table C-3: Pasture 1 shrub and tree density

NOTE: Fire July 2007 burned vegetation in plot.				
Site 11S04W27	***1986***	***1995***	***2001***	***2011***
Antelope Bitterbrush	225	0	225	0
Low Sagebrush	0	4700	3950	0
Big Sagebrush (Wyoming)	7650	525	0	0
X Low Sagebrush	0	0	125	0
X Western Juniper	125	100	125	0

Pasture 2 – Carter Creek
Frequency Table Statistics

- T-test Using # Hits (not % frequency)
- For years in which a species was not encountered but had been encountered in previous years, data values were entered as zeros. (Data values for species not encountered in a given year but encountered in later years were not entered as zeros since many plants were intentionally not recorded in previous years, i.e. annuals.)
- Most of the pre-1995 data were taken from old data reports, not access reports.
- A p-value <0.1 indicates a statistically significant difference.

Table C-4: Pasture 2 grasses and shrubs

GRASSES

12S03W29A - Basin Wildrye (ELCI2), Plot 4					*12S03W29A – Cheatgrass (BRTE), Plot 4*				
Belt	***1995***	***2001***	***2007***	***2011***	***Belt***	***1995***	***2001***	***2007***	***2011***
1	0	0	0	0	***1***	0	0	0	0
2	0	0	0	0	***2***	0	0	0	0
3	0	0	0	0	***3***	0	0	0	0
4	0	0	0	0	***4***	4	0	0	1
5	1	1	0	0	***5***	4	0	0	0
Avg	0.2	0.2	0	0	***Avg***	1.6	0	0	0.2
S	0.4472	0.4472	0.0000	0.0000	***S***	2.1909	0.0000	0.0000	0.4472
p		1.0000	0.3739	1.0000	***p***		0.1778	1.0000	0.3739

12S03W29A - Bluebunch Wheatgrass (AGSP), Plot 4					*12S03W29A - Idaho Fescue (FEID), Plot 4*				
Belt	***1995***	***2001***	***2007***	***2011***	***Belt***	***1995***	***2001***	***2007***	***2011***
1	10	7	6	8	***1***	18	17	14	18
2	8	8	5	4	***2***	17	17	17	14
3	10	12	8	6	***3***	15	13	17	13
4	5	4	6	4	***4***	16	14	16	11
5	5	5	2	5	***5***	14	14	13	13
Average	7.6	7.2	5.4	5.4	***Average***	16	15	15.4	13.8
S	2.5100	3.1145	2.1909	1.6733	***S***	1.58114	1.87083	1.81659	2.58844
p		0.6483	0.1671	1.0000	***p***		0.08901	0.75723	0.38213

12S03W29A - Sandberg Bluegrass (POSA3), Plot 4					*12S03W29A – Squirreltail (SIHY), Plot 4*				
Belt	***1995***	***2001***	***2007***	***2011***	***Belt***	***1995***	***2001***	***2007***	***2011***
1	17	20	20	19	***1***	8	9	6	7
2	17	20	20	20	***2***	6	5	7	1
3	18	19	20	19	***3***	4	9	9	6
4	15	19	20	18	***4***	5	8	3	3
5	17	20	20	20	***5***	9	6	14	8
Average	16.8	19.6	20	19.2	***Average***	6.4	7.4	7.8	5
S	1.0954	0.5477	0.0000	0.8367	***S***	2.0736	1.8166	4.0866	2.9155
p		0.0046	0.1778	0.0993	***p***		0.5185	0.8675	0.1281

Ground Cover by Percentage

- Although they appear to be similar, data collection methods for years recorded in the access reports may be different than those conducted for 1989.
- Total Vegetation" and "Canopy Cover" cannot be determined from old data reports.
- A p-value <0.1 is significant.
- Long- term 1989-2009 reflects comparison between first and last monitored year (values <0.1 are significant).

Table C-5: Pasture 2 ground cover

	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
	12S03W29A - Bare Ground, Plot 4, %					
Bare Ground	***1***	40	46.25	37.5	13.75	15
Under "bare ground"	***2***		35	40	21.25	22.5
intsp+cpy	***3***	51.25	28.75	48.75	11.25	35
	4		26.25	40	15	35
	5		33.75	36.25	13.75	23.75
	Average	45.625	34	40.5	15	26.25
	S	7.9550	7.7258	4.8894	3.7500	8.6603
	p		0.6725	0.2576		
	Long-term 1984-2011					0.1331
	12S03W29A - Basal Vegetation, Plot 4, %					
	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
Basal Vegetation Under "vegetation" shrub+intsp+cpy	***1***	13.75	16.25	12.5	0	3.75
	2		7.5	16.25	0	18.75
	3	22.5	17.5	11.25	6.25	15
	4		11.25	13.75	3.75	12.5
	5		12.5	11.25	1.25	13.75
	Average	18.13	13	13	2.25	12.75
	S	6.1872	4.0117	2.0917	2.7099	5.5481
	p		0.7952	1.0000		
	Long-term 1984-2011					
	12S03W29A - GR, Rk, PL, CR, Plot 4, %					
	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
Gravel	***1***	28.75	23.75	27.5	45	31.25
Rock	***2***		40	21.25	42.5	25
Persistent Litter	***3***	16.25	33.75	13.75	12.5	11.25
Biological Crust	***4***		30	11.25	12.5	17.5
Under "per litter",	***5***		28.75	15	10	20

	Belt	1984	1995	2001	2007	2011
"cryptogams", "gravel", and "stones" (all) insp+(all) cpy						
	Average	22.5	31.25	17.75	24.5	21
	S	8.8388	6.0596	6.5788	17.6246	7.5726
	p		0.6772	0.0385	0.2704	0.5447
	Long-term 1984-2011					0.7952
	12S03W29A - Non-Persistent Litter, Plot 4, %					
	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
Non-Persistent Litter Under "nonper litter" instp+cpy	***1***	17.5	13.75	37.5	55	50
	2		17.5	40	36.25	33.75
	3	10	20	48.75	70	38.75
	4		32.5	40	66.25	35
	5		25	36.25	75	42.5
	Average	13.75	21.75	40.5	60.5	40
	S	5.3033	7.2672	4.8894	15.4262	6.5551
	p		0.7284	0.0095	0.0449	0.0403
	Long-term 1984-2011					0.0389
	12S03W29A - Total Vegetation, Plot 4, %					
	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
Total Vegetation	***1***			16.25	12.5	17.5
"Vegetation"+all cpy sections	***2***			21.25	8.75	30
	3			20	30	38.75
	4			18.75	22.5	35
	5			13.75	20	32.5
	Average			18	18.75	30.75
	S			3.0104	8.3853	8.0816
	p				0.8605	0.0113
	Long-term 2001-2011					0.0201
	12S03W29A - Canopy Cover, Plot 4, %					
	Belt	***1984***	***1995***	***2001***	***2007***	***2011***
Canopy Cover	***1***			5	12.5	13.75
Add all cpy	***2***			6.25	8.75	12.5
	3			8.75	23.75	25
	4			5	18.75	23.75

	Belt	1984	1995	2001	2007	2011
	5			2.5	20	21.25
	Average			5.5	16.75	19.25
	S			2.2707	6.0338	5.7690
	p				0.0148	0.0341
	Long-term 2001-2011					0.0063

NOTE: Data for 1984 and 1995 taken from old data reports.

Shrub and Tree Density

- Plants/acre from mean of two plots.
- X = Seedling.

Table C-6: Pasture 2 shrub and tree density

Site 12S03W29A	1984	1995	2001	2007	2011
Low Sagebrush		6900	8200	5700	5000
Big Sagebrush (Wyoming)		1000	1600	4300	7400
X Big Sagebrush (Wyoming)		0	6100	0	400
Green Rabbitbrush		0	400	400	600

Pasture 3 – Red Basin
Frequency Table Statistics

- T-test Using # Hits (not % frequency)
- For years in which a species was not encountered but had been encountered in previous years, data values were entered as zeros. (Data values for species not encountered in a given year but encountered in later years were not entered as zeros since many plants were intentionally not recorded in previous years, i.e. annuals.)
- Most of the pre-1995 data were taken from old data reports, not access reports.
- A p-value <0.1 indicates a statistically significant difference.

Table C-7: Pasture 3 grasses and shrubs

GRASSES

	Belt	1988	1995	2001	2007	2011
12S04W32 - Bluebunch Wheatgrass (AGSP), Plot 4						
	1	5	5	6	10	3
	2	4	9	10	12	11
	3	14	9	12	7	6
	4	7	14	14	10	3
	5	7	7	5	9	3
	Average	7.4	8.8	9.4	9.6	5.2
	S	3.9115	3.3466	3.8471	1.8166	3.4928
	p		0.5436	0.5012	0.9236	0.0348

	Belt	1988	1995	2001	2007	2011
	12S04W32 – Cheatgrass (BRTE), Plot 4					
	Belt	1988	1995	2001	2007	2011
	1		0	0	15	9
	2		0	0	11	6
	3		0	0	17	16
	4		3	0	16	16
	5		3	0	13	9
	Average		1.2	0	14.4	11.2
	S		1.6432	0.0000	2.4083	4.5497
	p			0.1778	0.0002	0.0506
	12S04W32 - Idaho Fescue (FEID), Plot 4					
	Belt	1988	1995	2001	2007	2011
	1	10	14	9	15	10
	2	6	8	7	16	7
	3	10	9	8	16	5
	4	2	4	5	9	5
	5	3	2	5	10	3
	Average	6.2	7.4	6.8	13.2	6
	S	3.7683	4.6690	1.7889	3.4205	2.6458
	p		0.2835	0.6745	0.0023	0.0049

12S04W32 - Sandberg Bluegrass (POSA3), Plot 4					
Belt	1988	1995	2001	2007	2011
1	19	18	19	19	18
2	20	19	20	20	18
3	15	17	19	12	19
4	18	17	20	18	13
5	16	18	20	19	20
Average	17.6	17.8	19.6	17.6	17.6
S	2.0736	0.8367	0.5477	3.2094	2.7019
p		0.7990	0.0086	0.1998	1.0000
12S04W32 – Needlegrass (STIPA), Plot 4					
Belt	1988	1995	2001	2007	2011
1			4	3	0
2			1	3	0
3			1	1	0
4			0	1	0
5			0	4	1
Average			1.2	2.4	0.2
S			1.6432	1.3416	0.4472
p				0.2355	0.0109

12S04W32 – Squirreltail (SIHY), Plot 4					
Belt	1988	1995	2001	2007	2011
1	19	15	17	7	9
2	20	16	15	8	10
3	16	13	15	6	10
4	16	16	14	10	15
5	13	14	14	8	5
Average	16.8	14.8	15	7.8	9.8
S	2.7749	1.3038	1.2247	1.4832	3.5637
p		0.1292	0.8149	0.0025	0.2204

(No Shrub Data Available)
Ground Cover by Percentage

- Although they appear to be similar, data collection methods for years recorded in the access reports may be different than those conducted for 1989.
- Total Vegetation" and "Canopy Cover" cannot be determined from old data reports.
- A p-value <0.1 is significant.
- Long- term 1989-2009 reflects comparison between first and last monitored year (values <0.1 are significant).

Table C-8: Pasture 3 ground cover

	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
12S04W32 - Bare Ground, Plot 4, %						
Bare Ground						
Under "bare ground" intsp+cpy	***1***	28.75	40	50	28.75	23.75
	2	40	40	51.25	30	21.25
	3	32.5	55	43.75	15	27.5
	4	18.75	47.5	33.75	21.25	25
	5	17.5	45	31.25	13.75	22.5
	Average	27.5	45.5	42	21.75	24
	S	9.4786	6.2249	9.1686	7.5312	2.4044
	p		0.0300	0.5780	0.0016	0.6055
	Long-term 1988-2011					0.4798
	12S04W32 - Basal Vegetation, Plot 4, %					
Basal Vegetation	***Belt***	***1988***	***1995***	***2001***	***2007***	***2011***
Under "vegetation" shrub+intsp+cpy	***1***	10	11.25	10	2.5	5
	2	12.5	8.75	6.25	0	10
	3	8.75	7.5	7.5	2.5	2.5
	4	6.25	6.25	7.5	1.25	6.25
	5	11.25	11.25	11.25	3.75	11.25

	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
	Average	9.75	9	8.5	2	7
	S	2.4044	2.2361	2.0540	1.4252	3.6012
	p		0.4263	0.4766	0.0002	0.0474
	Long-term 1988-2011					0.0972
	12S04W32 - GR, Rk, PL, CR, Plot 4, %					
Gravel	***Belt***	***1988***	***1995***	***2001***	***2007***	***2011***
Rock	***1***	21.25	31.25	15	7	11.25
Persistent Litter	***2***	12.5	32.5	15	4	10
Biological Crust	***3***	20	17.5	7.5	3	2.5
Under "per litter",	***4***	25	26.25	18.75	4	15
"cryptogams", "gravel", and "stones" (all) insp+(all) cpy	***5***	23.75	18.75	26.25	9	17.5
	Average	20.5	25.25	16.5	5.4	11.25
	S	4.8894	6.9259	6.8122	2.5100	5.7282
	p		0.3585	0.1220	0.0083	0.0403
	Long-term 1988-2011					0.0205
Non-Persistent Litter	***12S04W32 - Non-Persistent Litter, Plot 4, %***					
Under "nonper litter"	***Belt***	***1988***	***1995***	***2001***	***2007***	***2011***
instp+cpy	***1***	40	17.5	25	60	60
	2	35	18.75	27.5	65	58.75
	3	38.75	20	41.25	78.75	67.5
	4	50	20	40	72.5	53.75
	5	47.5	25	31.25	71.25	48.75
	Average	42.25	20.25	33	69.5	57.75
	S	6.2750	2.8504	7.3208	7.2133	7.0378
	p		0.0007	0.0171	0.0000	0.0451
	Long-term 1988-2011					0.0479
Total Vegetation	***12S04W32 - Total Vegetation, Plot 4, %***					
"Vegetation"+all cpy	***Belt***	***1988***	***1995***	***2001***	***2007***	***2011***
sections	***1***			10	2.5	5
	2			6.25	0	10
	3			7.5	3.125	2.5
	4			7.5	1.25	6.25
	5			11.25	3.75	11.25
	Average			8.5	2.125	7
	S			2.0540	1.5052	3.6012
	p				0.0004	0.0586
	Long-term 2001-2011					0.4144

Canopy Cover	***12S04W32 - Canopy Cover, Plot 4, %***					
Add all cpy	***Belt***	***1988***	***1995***	***2001***	***2007***	***2011***
	1			0	0	5
	2			0	0	0
	3			0	0	0
	4			0	0	0
	5			0	0	0
	Average			0	0	1
	S					
	p					

Shrub and Tree Density

- Plants/acre from mean of two plots.
- X = Seedling.

Table C-9: Pasture 3 shrub and tree density

NOTE: No graph for shrub/tree data at 12S04W32 due to lack of data over multiple years.					
Site 12S04W32	***1988***	***1995***	***2001***	***2007***	***2011***
Green Rabbitbrush					100

Pasture 4 – Lambert Table
Frequency Table Statistics

- T-test Using # Hits (not % frequency)
- For years in which a species was not encountered but had been encountered in previous years, data values were entered as zeros. (Data values for species not encountered in a given year but encountered in later years were not entered as zeros since many plants were intentionally not recorded in previous years, i.e. annuals.)
- Most of the pre-1995 data were taken from old data reports, not access reports.
- A p-value <0.1 indicates a statistically significant difference.

Table C-10: Pasture 4 grasses and shrubs

GRASSES SITE 13S03W08

Belt	1988	1995	2001	2007	2011
13S03W08 - Bluebunch Wheatgrass (AGSP), Plot 4					
1	0	2	0	3	0
2	1	2	1	1	0
3	2	2	0	0	0
4	1	1	0	2	0
5	1	0	1	0	0
Average	1	1.4	2	1.2	0
S	0.7071	0.8944	0.5477	1.3038	0.0000

Belt	1988	1995	2001	2007	2011
p		0.4766	0.1419	0.3375	0.1087
13S03W08 - Idaho Fescue (FEID), Plot 4					
Belt	1988	1995	2001	2007	2011
1	5	7	11	13	12
2	8	10	10	18	11
3	9	9	9	10	8
4	6	13	12	17	11
5	12	15	14	14	11
Average	8	10.8	11.2	14.4	10.6
S	2.7386	3.1937	1.9235	3.2094	1.5166
p		0.0729	0.6885	0.0940	0.0304
13S03W08 - Sandberg Bluegrass (POSA3), Plot 4					
Belt	1988	1995	2001	2007	2011
1	19	14	20	20	19
2	15	17	18	19	20
3	17	19	19	19	17
4	19	16	19	20	17
5	15	18	18	20	20
Average	17	16.8	18.8	19.6	18.6
S	2.0000	1.9235	0.8367	0.5477	1.5166
p		0.9062	0.1543	0.0993	0.2302
13S03W08 – Squirreltail (SIHY), Plot 4					
Belt	1988	1995	2001	2007	2011
1	12	8	9	8	3
2	12	6	10	6	4
3	14	9	9	8	4
4	20	4	7	9	6
5	14	11	9	7	4
Average	14.4	7.6	8.8	7.6	4.2
S	3.2863	2.7019	1.0954	1.1402	1.0954
p		0.0446	0.3239	0.2835	0.0026

SHRUBS

Belt	1988	1995	2001	2007	2011
13S03W08 - Big Sagebrush (ARTR), Plot 4					
1		0	0	0	0
2		0	0	0	0
3		1	1	0	0
4		0	0	0	0
5		0	0	0	0
Average		0.2	0.2	0	0

Belt	1988	1995	2001	2007	2011
S		0.4472	0.4472	0.0000	0.0000
p			1.0000	0.3739	1.0000
13S03W08 - Low Sagebrush (ARAR8), Plot 4					
Belt	1988	1995	2001	2007	2011
1	17	16	11	15	13
2	14	15	11	12	11
3	15	8	6	12	8
4	19	11	12	13	14
5	12	9	6	11	14
Average	15.4	11.8	9.2	12.6	12
S	2.7019	3.5637	2.9496	1.5166	2.5495
p		0.1045	0.0650	0.0299	0.6455
13S03W08 - X Low Sagebrush (XARAR8), Plot 4					
Belt	1988	1995	2001	2007	2011
1			0	2	2
2			0	2	4
3			2	2	4
4			0	2	0
5			1	4	0
Average			0.6	2.4	2
S			0.8944	0.8944	2.0000
p				0.0213	0.7489

Ground Cover by Percentage

- Although they appear to be similar, data collection methods for years recorded in the access reports may be different than those conducted for 1989.
- Total Vegetation" and "Canopy Cover" cannot be determined from old data reports.
- A p-value <0.1 is significant.
- Long- term 1989-2009 reflects comparison between first and last monitored year (values <0.1 are significant).

Table C-11: Pasture 4 ground cover

	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
Bare Ground	***13S03W08 - Bare Ground, Plot 4, %***					
Under "bare ground" intsp+cpy	***1***	36.25	30	45	26.25	40
	2	50	42.5	56.25	38.75	0
	3	58.75	45	53.75	27.5	48.75
	4	52.5	56.25	31.25	33.75	26.25
	5	42.5	53.75	52.5	45	53.75
	Average	48	45.5	47.75	34.25	33.75
	S	8.7767	10.4058	10.1319	7.8362	21.5602

	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
	p		0.6032	0.7759	0.0538	0.9648
	Long-term 1988-2011			0.2644		
	13S03W08 - Basal Vegetation, Plot 4, %					
	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
Basal Vegetation Under "vegetation" shrub+intsp+cpy	***1***	10	20	8.75	6.25	6.25
	2	3.75	12.5	10	2.5	10
	3	11.25	10	5	7.5	6.25
	4	17.5	11.25	10	6.25	12.5
	5	2.5	12.5	10	1.25	7.5
	Average	9	13.25	8.75	4.75	8.5
	S	6.0853	3.9131	2.1651	2.7099	2.7099
	p		0.2756	0.0662	0.1151	0.1072
	Long-term 1988-2011			0.8523		
	13S03W08 - GR, Rk, PL, CR, Plot 4, %					
	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
Gravel ***Rock*** ***Persistent Litter*** ***Biological Crust*** Under "per litter", "cryptogams", "gravel", and "stones" (all) insp+(all) cpy	***1***	41.25	30	21.25	15	17.5
	2	32.5	36.25	21.25	10	65
	3	16.25	27.5	20	10	20
	4	17.5	12.5	25	7.5	12.5
	5	46.25	16.25	22.5	12.5	18.75
	Average	30.75	24.5	22	11	26.75
	S	13.5957	9.8663	1.8957	2.8504	21.5711
	p		0.4260	0.6502	0.0038	0.1864
	Long-term 1988-2011			0.7300		
	13S03W08 - Non-Persistent Litter, Plot 4, %					
	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
Non-Persistent Litter Under "nonper litter" instp+cpy	***1***	12.5	20	25	52.5	36.25
	2	13.75	8.75	12.5	48.75	25
	3	13.75	17.5	21.25	55	21.25
	4	12.5	20	33.75	52.5	41.25
	5	8.75	17.5	15	41.25	20
	Average	12.25	16.75	21.5	50	28.75
	S	2.0540	4.6435	8.4502	5.3765	9.4786
	p		0.1485	0.1422	0.0008	0.0050
	Long-term 1988-2011			0.0160		
	13S03W08 - Total Vegetation, Plot 4, %					
	Belt	***1988***	***1995***	***2001***	***2007***	***2011***

	Belt	1988	1995	2001	2007	2011
Total Vegetation "Vegetation"+all cpy sections	***1***			25	33.75	21.25
	2			18.75	15	37.5
	3			17.5	18.75	23.75
	4			42.5	28.75	30
	5			13.75	17.5	27.5
	Average			23.5	22.75	28
	S			11.3674	8.0719	6.2874
	p				0.8541	0.4096
	Long-term 2001-2011			0.4737		
	13S03W08 - Canopy Cover, Plot 4, %					
	Belt	***1988***	***1995***	***2001***	***2007***	***2011***
Canopy Cover	***1***			17.5	27.5	15
Add all cpy	***2***			8.75	13.75	28.75
	3			12.5	11.25	20
	4			21.25	22.5	20
	5			3.75	16.25	22.5
	Average			12.75	18.25	21.25
	S			6.9259	6.6497	5.0000
	p				0.1000	0.5648
	Long-term 2001-2011			0.14911		

NOTE: Data for 1988 and 1995 taken from old data reports.

Shrub and Tree Density

- Plants/acre from mean of two plots.
- X = Seedling.

Table C-12: Pasture 4 shrub and tree density

Site 13S03W08	***1988***	***1995***	***2001***	***2007***	***2011***
Low Sagebrush	8850	6400	5300	5300	6500
X Low Sagebrush	900	0	0	0	2000
Big Sagebrush (Wyoming)	0	0	50	0	0

APPENDIX D: CASTLEHEAD-LAMBERT 2001 and 2009 Rangeland Health Indicators and 2011 Attribute Ratings

2001 Castlehead-Lambert Monitoring

Table D-1: Castlehead-Lambert pasture 1 location information

Pasture	Site # ID	Location (Sec., Township, Range)	Ecological Site
Castlehead (1)	071001-1A	11S04W28	Loamy 13-16
	071001-2A	12S04W04	Loamy 13-16
	071001-3A	12S04W05	Loamy 13-16
	071001-5A	12S04W03	Loamy 13-16
	061901-RHA2	11S04W33	Mahogany-Upland 14-16
	071001-4A	12S04W08	Shallow Claypan 12-16
	071001-6A	12S04W10	Shallow Claypan 12-16
	071001-4A	11S04W27	Shallow Claypan 12-16

Table D-2: 2001 Rangeland Health Indicator ratings[2] for pasture 1

Indicator	Indicator Type[1]	Site 071001-1A	Site 071001-2A	Site 071001-3A	Site 071001-5A	Site 061901-RHA2	Site 071001-4A	Site 071001-6A	Site 071001-4A
1. Rills	S,H	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
2. Water Flow Patterns	S,H	s-m	n-s	n-s	n-s	n-s	n-s	s-m	s-m
3. Pedestals/Terracettes	S,H	n-s	n-s	n-s	s-m	n-s	s-m	s-m	s-m
4. Bare Ground	S,H	s-m	n-s	n-s	s-m	m	s-m	s-m	s-m
5. Gullies	S,H	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	n-s	n-s	s-m
8. Soil Surface Resistance to Erosion	S,H,B	n-s	n-s	n-s	n-s	n-s	n-s	s-m	s-m
9. Soil Surface Loss or Degradation	S,H,B	s-m	n-s	n-s	s-m	n-s	s-m	s-m	s-m
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	s-m	n-s	s-m	s-m	n-s	n-s	n-s	s-m
11. Compaction Layer	S,H,B	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
12. Functional/Structural Groups	B	m	s-m	s-m	s-m	m-e	s-m	n-s	n-s
13. Plant Mortality/Decadence	B	s-m	n-s	n-s	n-s	s-m	n-s	n-s	n-s
14. Litter Amount	H,B	m	n-s	s-m	n-s	n-s	n-s	n-s	s-m
15. Annual Production	B	n-s	n-s	n-s	n-s	n-s	n-s	n-s	s-m
16. Invasive Plants	B	m-e	m-e	e	m-e	m-e	m-e	m-e	n-s
17. Reproductive Capability of Perennial Plants	B	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s

[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator
[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-3: 2011 Attribute Ratings for Rangeland Health Assessments for pasture 1

Attribute	**Rating**							
Site # ID	**071001-1A**	**071001-2A**	**071001-3A**	**071001-5A**	**061901-RHA2**	**071001-4A**	**071001-6A**	**071001-4A**
Soil/Site Stability (S)	s-m	n-s	n-s	n-s	n-s	n-s	n-s (*s-m*)	*s-m*
Hydrologic Function (H)	s-m	n-s	n-s	n-s (*s-m*)	n-s	n-s	n-s (*s-m*)	*s-m*
Biotic Integrity (B)	m	s-m	s-m	n-s (*m*)	m	s-m	n-s (*s-m*)	*s-m*

Letters in italics display final ratings determined during the interdisciplinary team revision in 2011 where final calls were missing or were the original call was borderline.
Changes to previous calls made in 2001 were applied based on all available information

Pasture 2 – Carter Spring

Table D-4: Castlehead-Lambert pasture 2 location information

Pasture	**Site # ID**	**Location (Sec., Township, Range)**	**Ecological Site**
Carter Spring (2)	071101-4A	12S04W12	Shallow Claypan 12-16
	071101-1A	12S04W14	Shallow Claypan 12-16
	711-3B	12S04W26A	Shallow Claypan 12-16
	711-2B	12S04W26B	Shallow Claypan 12-16
	071101-2A	12S03W20	Loamy 12-16
	RHA2	12S03W29	Loamy 13-16

Table D-5: Castlehead-Lambert 2001 Rangeland Health Indicator ratings[2] for pasture 2

Indicator	Indicator Type[1]	Site 071101-4A	Site 071101-1A	Site 711-3B	Site 711-2B	Site 071101-2A	Site RHA2
1. Rills	S,H	n-s	n-s	n-s	n-s	n-s	n-s
2. Water Flow Patterns	S,H	n-s	s-m	s-m	m	s-m	n-s
3. Pedestals/Terracettes	S,H	n-s	M	s-m	m	m	n-s
4. Bare Ground	S,H	m	s-m	n-s	s-m	m	s-m
5. Gullies	S,H	n-s	n-s	n-s	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	n-s
8. Soil Surface Resistance to Erosion	S,H,B	s-m	s-m	n-s	m	s-m	s-m
9. Soil Surface Loss or Degradation	S,H,B	s-m	s-m	s-m	m	s-m	n-s
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	n-s	s-m	n-s	s-m	s-m	n-s
11. Compaction Layer	S,H,B	n-s	n-s	n-s	n-s	n-s	n-s
12. Functional/Structural Groups	B	s-m	s-m	n-s	s-m	m	n-s
13. Plant Mortality/Decadence	B	s-m	s-m	n-s	s-m	n-s	n-s
14. Litter Amount	H,B	n-s	s-m	n-s	n-s	n-s	s-m
15. Annual Production	B	n-s	n-s	n-s	n-s	n-s	s-m
16. Invasive Plants	B	m-e	m-e	s-m	s-m	e	n-s
17. Reproductive Capability of Perennial Plants	B	n-s	n-s	n-s	n-s	n-s	n-s

[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator
[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-6: 2011 Attribute Ratings for Rangeland Health Assessments for pasture 2

Attribute	**Rating**					
Site # ID	**071101-4A**	**071101-1A**	**711-3B**	**711-2B**	**071101-2A**	**RHA2**
Soil/Site Stability (S)	s-m	s-m	s-m	m	s-m	s-m
Hydrologic Function (H)	s-m	s-m	s-m	m	s-m	n-s
Biotic Integrity (B)	m	M	s-m	s-m	m	s-m

Pasture 3 – Red Basin

Table D-7: Castlehead-Lambert pasture 3 location information

Pasture	**Site # ID**	**Location (Sec., Township, Range)**	**Ecological Site**
Red Basin (3)	071101-5B	12S04W35	Shallow Breaks 14-18
	071101-7B	12S04W33	Loamy 12-16
	13S04W05	13S04W05	Shallow Claypan 12-16
	071101-4B	12S04W26C	Shallow Claypan 12-16
	061901-RHA1	12S04W32	Shallow Claypan 12-16
	071101-6B	12S04W34	Shallow Claypan 12-16

Table D-8: Castlehead-Lambert 2001 Rangeland Health Indicator ratings[2] for pasture 3

Indicator	Indicator Type[1]	Site 071101-5B	Site 071101-7B	Site 13S04W05	Site 071101-4B	Site 061901-RHA1	Site 071101-6B
1. Rills	S,H	n-s	n-s	n-s	n-s	n-s	n-s
2. Water Flow Patterns	S,H	n-s	n-s	n-s	m	s-m	s-m
3. Pedestals/Terracettes	S,H	n-s	n-s	n-s	m	s-m	s-m
4. Bare Ground	S,H	n-s	s-m	n-s	n-s	s-m	s-m
5. Gullies	S,H	n-s	n-s	n-s	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	s-m
8. Soil Surface Resistance to Erosion	S,H,B	n-s	s-m	n-s	n-s	s-m	s-m
9. Soil Surface Loss or Degradation	S,H,B	n-s	n-s	m	m-e	s-m	s-m
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	n-s	s-m	n-s	m	s-m	s-m
11. Compaction Layer	S,H,B	n-s	n-s	s-m	n-s	n-s	n-s
12. Functional/Structural Groups	B	n-s	m	n-s	m	s-m	m
13. Plant Mortality/Decadence	B	n-s	n-s	n-s	s-m	s-m	s-m
14. Litter Amount	H,B	n-s	s-m	n-s	m	s-m	s-m
15. Annual Production	B	n-s	n-s	n-s	m	s-m	s-m
16. Invasive Plants	B	s-m	E	m	s-m	s-m	s-m
17. Reproductive Capability of Perennial Plants	B	n-s	s-m	n-s	s-m	s-m	s-m

[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator

[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-9: 2011 Attribute Ratings for Rangeland Health Assessments for pasture 3

Attribute	**Rating**					
Site # ID	**071101-5B**	**071101-7B**	**13S04W05**	**071101-4B**	**061901-RHA1**	**071101-6B**
Soil/Site Stability (S)	n-s	s-m	s-m	m	s-m	s-m
Hydrologic Function (H)	n-s	n-s	n-s	m	s-m	s-m
Biotic Integrity (B)	s-m	m-e	s-m	m	s-m	s-m

Pasture 4 – Lambert Table

Table D-10: Castlehead-Lambert pasture 4 location information

Pasture	**Site # ID**	**Location (Sec., Township, Range)**	**Ecological Site**
Lambert Table (4)	13S03W08	13S03W08	Clayey 12-15
	071001-1C	13S03W09	Clayey 12-15
	071001-1BD	13S04W05	Shallow Claypan 12-16
	071001-6C	13S04W14	Shallow Claypan 12-16
	071001-4C	13S04W25	Loamy 12-16
	071101-2BD	13S03W18	Loamy 12-16
	071001-2C	13S03W29	Loamy 12-16
	071001-5C	13S04W23	Loamy 12-16
	071001-3B	13S04W24	Loamy 12-16

Table D-11: Castlehead-Lambert 2001 Rangeland Health Indicator ratings[2] for pasture 4

Indicator	Indicator Type[1]	Site 13S03W 08	Site 071001-1C	Site 071001-1BD	Site 071001-6C	Site 071001-4C	Site 071101-2BD	Site 071001-2C	Site 071001-5C	Site 071001-3B
1. Rills	S,H	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
2. Water Flow Patterns	S,H	s-m	n-s	n-s	n-s	n-s	n-s	n-s	s-m	n-s
3. Pedestals/Terracettes	S,H	s-m	n-s	s-m	s-m	n-s	m	n-s	n-s	m
4. Bare Ground	S,H	s-m	s-m	n-s	s-m	s-m	m	s-m	s-m	m
5. Gullies	S,H	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
8. Soil Surface Resistance to Erosion	S,H,B	s-m	s-m	n-s	s-m	s-m	n-s	s-m	s-m	m
9. Soil Surface Loss or Degradation	S,H,B	n-s	n-s	s-m	s-m	n-s	m	n-s	n-s	m
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	s-m	n-s	n-s	n-s	n-s	s-m	n-s	n-s	n-s
11. Compaction Layer	S,H,B	m	n-s	n-s	n-s	n-s	s-m	n-s	n-s	m
12. Functional/Structural Groups	B	s-m	s-m	s-m	s-m	s-m	s-m	s-m	s-m	n-s
13. Plant Mortality/Decaden	B	s-m	n-s	n-s	s-m	n-s	n-s	n-s	n-s	s-m

Indicator	Indicator Type[1]	Site 13S03W 08	Site 071001-1C	Site 071001-1BD	Site 071001-6C	Site 071001-4C	Site 071101-2BD	Site 071001-2C	Site 071001-5C	Site 071001-3B
ce										
14. Litter Amount	H,B	s-m	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
15. Annual Production	B	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s	n-s
16. Invasive Plants	B	n-s	s-m	M	n-s	n-s	s-m	s-m	n-s	s-m
17. Reproductive Capability of Perennial Plants	B	s-m	n-s	n-s	s-m	n-s	n-s	n-s	n-s	n-s

[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator
[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-12: 2011 Attribute Ratings for Rangeland Health Assessments for pasture 4

Attribute	**Rating**								
Site # ID	**13S03W08**	**071001-1C**	**071001-1BD**	**071001-6C**	**071001-4C**	**071101-2BD**	**071001-2C**	**071001-5C**	**071001-3B**
Soil/Site Stability (S)	s-m	s-m	s-m	s-m	s-m	m	s-m	s-m	m
Hydrologic Function (H)	s-m	n-s	n-s	n-s	n-s	s-m	n-s	s-m	s-m
Biotic Integrity (B)	s-m	s-m	s-m	s-m	n-s	s-m	n-s	n-s	m

2009 Castlehead-Lambert Monitoring

Table D-13: Castlehead-Lambert pastures 1, 2, and 6 location information

Pasture	UTM and Site # ID	Location (Sec., Township, Range)	Ecological Site
6	515955E46924 76N RLHA6	12S04W16	Loamy 13-16
6	514148E4695995N RLHA7	12S04W05	Mahogany Savanna 16-22
1	517651E4698635N RLHA8	11S04W27	Loamy 13-16
1	515556E4695989N RLHA9	12S04W04	Mahogany Savanna 16-22
2	520636E4693093N RLHA4	12S04W12	Stony Loam 10-14
2	522525E4691414N RLHA5	12S03W18	Shallow Claypan 12-16

Table D-14: Castlehead-Lambert 2009 Rangeland Health Indicator ratings[2] pastures1, 2, and 6

Indicator	Indicator Type[1]	Site RLHA6	Site RLHA7	Site RLHA8	Site RLHA9	Site RLHA4	Site RLHA5
1. Rills	S,H	n-s	n-s	m	s-m	n-s	n-s
2. Water Flow Patterns	S,H	n-s	n-s	s-m	s-m	n-s	n-s
3. Pedestals/Terracettes	S,H	n-s	n-s	s-m	s-m	s-m	m
4. Bare Ground	S,H	n-s	n-s	s-m	s-m	n-s	s-m
5. Gullies	S,H	n-s	n-s	s-m	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	n-s

Indicator	Indicator Type[1]	Site RLHA6	Site RLHA7	Site RLHA8	Site RLHA9	Site RLHA4	Site RLHA5
8. Soil Surface Resistance to Erosion	S,H,B	n-s	s-m	m	n-s	n-s	n-s
9. Soil Surface Loss or Degradation	S,H,B	n-s	n-s	s-m	s-m	s-m	s-m
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	n-s	n-s	n-s	m	n-s	n-s
11. Compaction Layer	S,H,B	n-s	n-s	n-s	n-s	n-s	n-s
12. Functional/Structural Groups	B	n-s	s-m	s-m	m-e	n-s	s-m
13. Plant Mortality/Decadence	B	n-s	n-s	n-s	m-e	n-s	s-m
14. Litter Amount	H,B	n-s	n-s	n-s	s-m	n-s	s-m
15. Annual Production	B	n-s	n-s	n-s	n-s	n-s	s-m
16. Invasive Plants	B	s-m	s-m	s-m	e	s-m	s-m
17. Reproductive Capability of Perennial Plants	B	n-s	n-s	n-s	m	n-s	n-s

Table D-15: 2011 Attribute Ratings for Rangeland Health Assessments for pastures 1 and 2

Attribute	**Rating**					
UTM Site # ID	**515955E4692476N RLHA6**	**514148E4695995N RLHA7**	**517651E4698635N RLHA8**	**515556E4695989N RLHA9**	**520636E4693093N RLHA4**	**522525E4691414N RLHA5**
Soil/Site Stability (S)	n-s	n-s	s-m *(m)*	s-m	n-s	s-m
Hydrologic Function (H)	n-s	n-s	s-m	s-m	n-s	s-m
Biotic Integrity (B)	n-s *(s-m)*	n-s (*s-m*)	s-m	m-e	n-s *(s-m)*	s-m

Letters in italics display final ratings determined during the interdisciplinary team revision in 2011 where final calls were missing or were the original call was borderline.
Changes to previous calls made in 2001 were applied based on all available information
[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator
[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-16: Castlehead-Lambert location information for pastures 3, 4, and 5

Pasture	**UTM and Site # ID**	**Location (Sec., Township, Range)**	**Ecological Site**
3	**513660E4687519N RLHA2**	**12S04W32**	**Shallow Claypan 12-16**
3	**513132E4686105N RLHA1**	**11S05W05**	**Shallow Claypan 12-16**
4	**520399E4680867N RLHA10**	**13S04W24**	**Clayey 12-16**
4	**522993E4684750N RLHA11**	**13S03W08**	**Clayey 12-16**
5	**515332E4690893N RLHA3**	**12S04W21**	**Loamy 13-16**
5*	**071101-1B**	**12S04W28**	**Shallow Claypan 12-16**

*Data from 2001 monitoring

Table D-17: Castlehead-Lambert 2001 Rangeland Health Indicator ratings[2] for pastures 3, 4, and 5

Indicator	Indicator Type[1]	RLHA2	RLHA1	RLHA10	RLHA11	RLHA3	071101-1B
1. Rills	S,H	n-s	n-s	n-s	n-s	n-s	n-s
2. Water Flow Patterns	S,H	n-s	n-s	n-s	n-s	n-s	n-s
3. Pedestals/Terracettes	S,H	s-m	M	s-m	s-m	n-s	s-m
4. Bare Ground	S,H	s-m	s-m	s-m	s-m	n-s	n-s
5. Gullies	S,H	n-s	n-s	n-s	n-s	n-s	n-s
6. Wind Scoured, Blowouts and/or Depositions	S	n-s	n-s	n-s	n-s	n-s	n-s
7. Litter Movement	S	n-s	n-s	n-s	n-s	n-s	n-s
8. Soil Surface Resistance to Erosion	S,H,B	m	n-s	m	m	s-m	s-m
9. Soil Surface Loss or Degradation	S,H,B	s-m	n-s	s-m	s-m	s-m	n-s
10. Plant Community Comp. & Distribution Relative to Infiltration & Runoff	H	n-s	n-s	n-s	n-s	n-s	n-s
11. Compaction Layer	S,H,B	n-s	n-s	n-s	n-s	n-s	n-s
12. Functional/Structural Groups	B	n-s	n-s	n-s	n-s	n-s	n-s
13. Plant Mortality/Decadence	B	n-s	n-s	n-s	n-s	n-s	n-s
14. Litter Amount	H,B	n-s	n-s	s-m	s-m	n-s	n-s
15. Annual Production	B	n-s	n-s	n-s	n-s	n-s	s-m
16. Invasive Plants	B	s-m	n-s	s-m	s-m	s-m	n-s
17. Reproductive Capability of Perennial Plants	B	n-s	n-s	s-m	s-m	n-s	n-s

[1]S = Soil/Site Stability Indicator, H = Hydrologic Function Indicator, B = Biotic Integrity Indicator
[2]Departures from reference conditions; n-s = none to slight, s-m = slight to moderate, m = moderate, m-e = moderate to extreme, e = extreme

Table D-18: 2011 Attribute Ratings for Rangeland Health Assessments for pastures 3, 4, and 5

Attribute	**Rating**					
UTM Site # ID	**513660E4687519N RLHA2**	**513132E4686105N RLHA1**	**520399E4680867N RLHA10**	**522993E4684750N RLHA11**	**515332E4690893N RLHA3**	**071101- 1B**
Soil/Site Stability (S)	s-m	n-s	s-m	s-m	n-s	n-s
Hydrologic Function (H)	s-m	n-s	s-m	s-m	n-s	n-s
Biotic Integrity (B)	s-m	n-s	s-m	s-m	s-m	n-s

Appendix E: Common and scientific names of plants used in the Castlehead-Lambert, Garat and Swisher Evaluation Reports

Table E-1: Common and scientific names for plants referred to in the Evaluation Reports

Common Name	Scientific Name
aspen	*Populus tremuloides*
bitterbrush	*Purshia tridentate*
bluebunch wheatgrass	*Pseudoroegneria spicata*
bud sagebrush	*Picrothamnus desertorum*
bulbous bluegrass	*Poa bulbosa*
Canada thistle	*Cirsium arvense*
ceanothus	*Ceanothus velutinus*
cheatgrass	*Bromus tectorum*
crested wheatgrass	*Agropyron cristatum*
curl-leaf mountain mahogany	*Cercocarpus ledifolius*
currant	*Ribes spp.*
curveseed butterwort (bur buttercup)	*Ceratocephala testiculata*
Davis' peppergrass	*Lepidium davisii*
green rabbitbrush	*Ericameria teretifolia*
Idaho fescue	*Festuca idahoensis*
inch-high lupine	*Lupinus uncialis*
low sagebrush	*Artemisia arbuscula*
medusahead	*Taeniatherum caput-medusae*
mountain ball cactus	*Pediocactus simpsonii*
mountain big sagebrush	*Artemisia tridentata* ssp. *Vaseyana*
needlegrass	*Achnatherum spp.*
Newberry's milkvetch	*Astragalus newberryi* var. *castoreus*
rabbitbrush	*Chrysothamnus & Ericameria spp.*
rattlesnake stickseed	*Hackelia ophiobia*
Sandberg bluegrass	*Poa secunda*
Scotch cottonthistle (Scotch thistle)	*Onopordum acanthium*
Slickspot peppergrass	*Lepidium papilliferum*
small burnet	*Sanguisorba minor*
snowberry	*Symphoricarpos oreophilus*
squirreltail	*Elymus elymoides*
Stream orchid	*Epipactis gigantean*
thinleaf goldenhead	*Pyrrocoma linearis*
Thurber's needlegrass	*Achnatherum thurberianum*
Ute ladies'-tresses	*Spiranthes diluvialis*

Common Name	Scientific Name
Western germander	*Teucrium canadense var. occidentale*
western juniper (juniper)	*Juniperus occidentalis*
whitetop	*Cardaria draba*
Wood's rose	*Rosa woodsii*
willow	*Salix spp.*
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*

Nomenclature reference: USDA, NRCS PLANTS database as of January 2012

Appendix F: Special Status Wildlife Species

Table F-1: Special status wildlife species in the Owyhee Field Office and occurrence potential within the Castlehead/Lambert allotment

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
Snake River Physa	*Physa natricina*	ESA E	Believed to inhabit deep water on the margins of moderately swift rapids or riffles. Individuals have been found in relatively undisturbed areas with gravel, boulder, or cobble substrates and low percentage of epiphytic algae or macrophytes.	No	No	No
Columbia Spotted Frog	*Rana luteiventris*	ESA C (SGCN)	Cool, permanent, quiet water in streams, rivers, lakes, pools, springs, and marshes usually in hilly areas from sea level to about 3000 m. Highly aquatic, but may disperse into forests, grasslands, and shrublands	Yes; pastures 3, 4, and 5	Yes	Yes
Greater Sage-grouse	*Centrocercus urophasianus*	ESA C (SGCN/HPBB/BCC)	Broad sagebrush covered valleys and foothills interspersed with wet meadows.	Yes; throughout allotment, pastures 2	Yes	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
				and 4 in particular		
Yellow-billed Cuckoo	*Coccyzus americanus*	ESA C (SGCN/BCC)	Extensive, mature riparian woodlands, especially of cottonwoods or willows, and other open woodlands with dense understories at lower elevations. Mature riparian areas with willow and alder thickets.	No	No	No
American White Pelican	*Pelecanus erythrorhynchos*	BLM 2 (SGCN/HPBB)	Typically occur on isolated islands in freshwater lakes, marshes or rivers, on lakes, reservoirs and rivers supporting large fish populations and on mud, sand or gravel shores.	No	No	No
Bald Eagle	*Haliaeetus leucocephalus*	BGEPA – BLM 2 (SGCN/BCC)	Restricted to large rivers and water bodies near mixed conifer forest, occasionally sagebrush foothills. Nest in oldest trees in the stand. Always associated with aquatic forage area.	No	Probable	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
Golden Eagle	*Aquila chrysaetos*	BGEPA (HPBB/BCC)	Open habitats in mountains and hill country, prairies and other grasslands. Open sagebrush areas adjacent to nesting cliffs. Found on prairies, tundra, open wooded country, and barren areas, especially in hilly or mountainous areas. In Idaho, prefers open and semi-open areas in deserts and mountains.	Yes; foraging habitat throughout allotment	Probable	Yes
Northern Leopard Frog	*Rana pipiens*	BLM 2 (SGCN)	Permanent water sources on the plains, foothill, and in montane zones	Yes; streams in pasture 1	Improbable	Yes
Pygmy Rabbit	*Brachylagus idahoensis*	BLM 2 (SGCN)	Throughout much of the Great Basin; relatively large areas of tall/dense sagebrush and deep soils. In Idaho, closely associated with large stands of sagebrush; prefers areas of tall, dense sagebrush cover with high percent woody cover.	Yes; pastures 2, 3, and 4	Possible	Yes
Columbia River	*Oncorhynchus mykiss gibbsi*	BLM 2 (SGCN)	Redband trout are found in a range of	Yes; pasture 1	Yes	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
Redband Trout			stream habitats from desert areas in southwestern Idaho to forested mountain streams in central and northern Idaho.	(Little Smith Creek), pasture 3 (Red Canyon Creek), and pasture 6 (East and West Forks of Red Canyon Creek)		
White Sturgeon	*Acipenser transmontanus*	BLM 2 (SGCN)	Rely on streams, rivers, and estuarine habitat as well as marine waters during their lifecycle. Prefer to spawn in rivers with swift currents and large cobble; no nest is built.	No	No	No
Black Tern	*Chlidonias niger*	BLM 3 (SGCN)	Rivers and ponds. Nests in or on emergent vegetation in alkaline lakes and freshwater marshes, or in marshy areas along rivers, lakes, or ponds. Forages within a few	No	Improbable	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			hundred meters of nest.			
Brewer's Sparrow	*Spizella breweri*	BLM 3 (SGCN/HPBB/BCC)	Sagebrush steppe. Idaho study found Brewer's Sparrows prefer large, living sagebrush for nesting. A recent study in southwestern Idaho concluded that their distribution was influenced by both local vegetation cover and landscape-level features such as patch size.	Yes; throughout allotment	Probable	Yes
California Bighorn Sheep	*Ovis canadensis californiana*	BLM 3 (SGCN)	Extremely rugged mountain areas with jutting crags, deep canyons and precipitous cliffs. Grassy slopes near cliffs and rocky ridges in mountains. Mesic to xeric grass. Avoids dense vegetation cover. Semi-desert grassland. Canyonlands and foothills of the Owyhee River drainage.	Yes; pasture 3 (Red Basin) and pasture 4 (Lambert Table)	Yes	Yes
Calliope Hummingbird	*Stellula calliope*	BLM 3 (HPBB/BCC)	Secondary successional shrub/sapling. Aspen	Yes; throughout	Possible	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			thickets, along streams, open montane forests. Shrubby riparian areas and sparsely timbered sites. In Idaho, found in mountains along meadows, canyons and streams, in open montane forests and willow and alder thickets	allotment, pastures 1, 2, 5, and 6 in particular		
Columbia Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	BLM 3 (SGCN/HPBB)	Found in grasslands (especially with scattered woodlands), arid sagebrush, brushy hills, oak savannas, and edges of riparian woodlands. In west-central Idaho study, grouse preferred big sagebrush to other summer cover types; mountain shrub and riparian cover types were critical components of winter habitat.	No	No	No
Common Garter Snake	*Thamnophis sirtalis*	BLM 3	Usually found in habitats associated with water, such as streams, rivers, lakes, ponds and marshes. They can	Yes; streams in allotment	Possible	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			also be found in open meadows and coniferous forests.			
Ferruginous Hawk	*Buteo regalis*	BLM 3 (SGCN/HPBB/BCC)	Found in shrub steppe at periphery of juniper or other woodlands.	Yes; nesting and foraging throughout allotment	Possible	Yes
Flammulated Owl	*Otus flammeolus*	BLM 3 (SGCN/HPBB/BCC)	Prefers old growth. In Idaho, occupies older ponderosa pine, Douglas-fir, and mixed coniferous forests.	No	Improbable	No
Fringed Myotis	*Myotis thysanodes*	BLM 3 (SGCN)	Found primarily in desert shrublands, sagebrush-grassland, and woodland habitats (ponderosa pine forest, oak and pine habitats, Douglas-fir). Roosts in caves, mines, rock crevices, buildings, and other protected sites. Prefer to forage in riparian areas characterized by intermittent streams with wider channels (5.5 to 10.5 meters) than ones with channels less	Yes; foraging throughout allotment, pastures 1, 2, 5, and 6 in particular	Possible	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			than 2.0 meters wide.			
Hammond's Flycatcher	*Empidonax hammondii*	BLM 3 (HPBB)	Found in coniferous forests and woodlands. In Idaho, old-growth associates in Douglas-fir/ponderosa pine forests.	No	Improbable	No
Lewis' Woodpecker	*Melanerpes lewis*	BLM 3 (SGCN/HPBB/BCC)	Found in open forests and woodlands (often logged or burned), including oak, coniferous forests (primarily ponderosa pine), and riparian woodlands and orchards.	Yes; locally throughout allotment	Possible	Yes
Loggerhead Shrike	*Lanius ludovicianus*	BLM 3 (HPBB/BCC)	Found in open country with scattered trees and shrubs, in savannas, desert scrub and, occasionally, in open juniper woodlands. Often found on poles, wires or fenceposts.	Yes; throughout allotment	Probable	Yes
Longnose Snake	*Rhinocheilus lecontei*	BLM 3 (SGCN)	Found in desert lowland areas that have sandy or loose soil and numerous burrows.	No	No	No
Mojave Black-collared	*Crotaphytus bicinctores*	BLM 3 (SGCN)	Associated with arid habitats with sparse vegetation and the	No	No	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
Lizard			presence of rocks and boulders.			
Mountain Quail	*Oreortyx pictus*	BLM 3 (SGCN/HPBB)	Mountain quail breed and winter in shrub–dominated riparian communities of hawthorn, willow, and chokecherry in the intermountain West. Diet is dominated by plant material though invertebrates are very important during the first 8 weeks.	Yes	No	No
Northern Goshawk	*Accipiter gentilis*	BLM 3 (HPBB)	Found in deciduous and coniferous forests, along forest edges and in open woodlands. In Idaho, summers and nests in coniferous and aspen forests; winters in riparian and agricultural areas.	Yes; throughout allotment, pastures 1, 2, 5, and 6 in particular	Possible	Yes
Olive-sided Flycatcher	*Contopus borealis*	BLM 3 (HPBB)	Found in forests and woodlands (especially in burned-over areas with standing dead trees)	Yes; throughout allotment	Improbable	No
Peregrine Falcon	*Falco peregrinus*	BLM 3 (SGCN/BCC)	Cliffs near forest, lakes, ponds, and rivers. Most are thought to migrate	No	Improbable	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			south of Idaho during winter but individuals remain near urban nest sites in Nampa and Boise year around.			
Piute Ground Squirrel	*Spermophilus mollis*	BLM 3 (SGCN)	Sagebrush and grasslands.	Yes; pastures 2 and 3	Improbable	No
Prairie Falcon	*Falco mexicanus*	BLM 3 (HPBB)	Cliffs and rock outcrops in sagebrush steppe, grassland, montane meadows, marshes, and riparian areas.	Yes; throughout allotment	Probable	Yes
Sage Sparrow	*Samphispiza belli*	BLM 3 (HPBB/BCC)	Shrub steppe, mixed desert shrub/grassland communities.	Yes; throughout allotment	Probable	Yes
Spotted Bat	*Euderma maculatum*	BLM 3 (SGCN)	Various habitats from desert to montane coniferous forests. Observed in canyons of Owyhee County. Normally roost in deep rock crevices of canyon and cliff walls but specific roost characteristics are not well documented.	Yes; foraging throughout allotment, pasture 2, 3, 4, and 5 in particular	Yes	Yes
Townsend's Big-eared Bat	*Plecotus townsendii*	BLM 3 (SGCN)	Juniper, desert shrub, and dry coniferous forest throughout Idaho; day roosts and	Yes; foraging throughout allotment	Possible	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			hibernates in caves and abandoned mines, forages over water			
Western Groundsnake	*Sonora semiannulata*	BLM 3 (SGCN)	Xeric habitat characterized by sandy or loose soil textures, talus slopes, and boulder fields. Vegetation is typically sparse, comprising of shrubs, such as shadscale, sagebrush, greasewood, and bunchgrasses and annual grasses.	No	No	No
Western Toad	*Bufo boreas*	BLM 3	Wide variety of habitats such as desert springs and streams, meadows and woodlands, and in and around ponds, lakes, reservoirs, and slow-moving rivers and streams.	Yes; throughout allotment	Possible	Yes
Williamson's Sapsucker	*Sphyrapicus thyroideus*	BLM 3 (HPBB/BCC)	Dry open woods, orchards, farmlands, and foothills	No	No	No
Willow Flycatcher	*Empidonax trailii*	BLM 3 (HPBB/BCC)	Found in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands. In	Yes; locally in pastures 1 and 6	Possible	Yes

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			Idaho, associated with mesic and xeric willow (riparian) habitats.			
Woodhouse Toad	*Bufo woodhousii*	BLM 3 (SGCN)	Found in grasslands, shrub steppe, woods, river valleys, floodplains, and agricultural lands, usually in areas with deep, friable soils.	No	No	No
Black-throated Sparrow	*Amphispiza bilineata*	BLM 4	Open shrub areas with Sagebrush, Atripex, Rabbitbrush, saltsage, horsebrush. Not found in dense sagebrush stands. Found in desert scrub, thorn bush. In Idaho prefers open shrub areas dominated by big sage, spiny hopsage, or horsebrush exceeding 50cm in height.	Yes; pastures 2, 3, and 4	Improbable	No
Dark Kangaroo Mouse	*Microdipodops megacephalus*	BLM 4	Soft, sandy soils in hot dry sagebrush areas. In Idaho found in loose sands and gravel in shadscale scrub, sagebrush scrub, and alkali sink plant communities. May occur	Yes; locally in pasture 2, 3, 4, 5, and 6	Improbable	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			in sand dunes near margins of range			
Kit Fox	*Vulpes velox*	BLM 4	Inhabits arid and semi-arid regions encompassing desert scrub, chaparral, halophytic, and grassland communities. Loose textured soils may be preferred for denning.	No	No	No
Little Pocket Mouse	*Perognathus longimembris*	BLM 4	Shadscale and low sage areas on lower slopes of alluvial fans with pea-sized gravel. Found in sagebrush, creosote bush, and cactus communities. On slopes with widely spaces shrubs, found in firm, sandy soil overlain with pebbles. In Idaho, found in shadscale/low sage on lower slopes of alluvial fans.	No	No	No
Merriam's Ground Squirrel	*Spermophilus canus vigilis*	BLM 4	Prefers sandy soils in dry, open sagebrush and grassland habitats. Occurs in the lower Snake River Valley south and west of the	No	No	No

Common Name	Species	Status (conservation plans)[1]	General Habitat[2]	Habitat Present[3]	Species Present[4]	Species/Habitat Affected
			Snake River in Owyhee County, Idaho and Malheur County, Oregon from Reynolds Creek to Huntington and west to Westfall.			
White-faced Ibis	*Plegadis chihi*	BLM 4 (SGCN/HPBB)	Found mostly in freshwater areas, on marshes, swamps, ponds and rivers. In Idaho, prefers shallow-water areas.	Yes; pasture 4 reservoirs	Yes	Yes
Wyoming Ground Squirrel	*Spermophilus elegans nevadensis*	BLM 4	Mountainous areas and higher plateaus in open and semi-forested habitats. Grasslands. In Idaho found in grasslands and sagebrush, especially on upland slopes with loose, sandy soils. Occupies a variety of sage plain and grassland habitats such as valley bottoms and foothills, montane meadows, subalpine talus slopes, and reclaimed surface-mine areas.	Yes; pastures 2, 3, and 4	Possible	Yes

[1] Status includes Endangered (ESA E) and Candidate (ESA C) species listed under the Endangered Species Act (16 U.S.C. § 1531-1544), eagles (BGEPA) protected by the Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668d), and BLM Type 2 (BLM 2), Type 3, (BLM 3), and Type 4 (BLM 4) special status species (USDI-BLM 2003). Additional designations under state and national conservation plans include Idaho Species of Greatest Conservation Need (SGCN; IDFG 2006), Idaho Partners in Flight High Priority Breeding Bird (HPBB; IPIF 2000), and U.S. Fish and Wildlife Service Birds of Conservation Concern (BCC; USDI-FWS 2008).
[2] Habitat descriptions modified from IDVMD 2011.
[3] Presence of habitat within project area was determined from IDVMD 2011, Yensen and Sherman 2003, BLM unpublished data, and specialist expertise.
[4] Categories include species presence documented (**Yes**), species likely to occur based on preferred habitat and local species abundance and nearby (<5 miles) occurrences within 5 miles (**Probable**), species may occur based on preferred habitat and occurrences within 25 miles (**Possible**), species not likely to occur based on limited or lack of preferred habitat and occurrence over 50 miles (**Improbable**), and species not present due to lack of habitat (**No**).

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Appendix G: Castlehead-Lambert Allotment Actual Use and Utilization Data Recorded between 1986 and 2011

Table G-1: Actual use data for the Castlehead-Lambert allotment

Year	Castlehead Pasture[f]			Carter Pasture			Red Basin Pasture			Lambert Pasture			Horse Pasture			Allotment AUMs
	From	To	AUMs	From	To	AUMs	From	To	AUMs	From	To	AUMs	From	To	AUMs	
1986	8/14	9/20	447	7/17	8/14	489	6/15	8/15	574	4/15	7/15	1343	4/15	7/15	30	2,853
1987[a]			1081			553			547		REST					2,181
1988	7/10	10/15	1285		REST		6/7	7/11	646	4/16	6/8	934	4/13	4/21	22	2,865
1989	7/8	9/30	1117	5/21	8/13	1038		REST		4/20	6/10	863				3,018
1990[b]	7/23	10/2	1228	4/15	5/24	632	5/22	7/25	1072		REST					2,932
1991[c]	7/8	9/30	514	5/21	7/8	1013		REST		4/15	5/30	845				2,372
1992	6/8	8/31	1163		REST		5/1	6/13	679	4/8	5/5	431				2,273
1993	7/2	10/15	1112	6/10	7/25	516		REST		4/15	6/25	1170				2,798
1994	7/25	10/4	1047	6/13	7/27	773	4/15	6/15	1108	REST						2,955
1995	8/1	10/3	991		REST		6/15	8/4	869	4/15	6/19	1158				3,018
1996	7/31	10/8	1044	6/12	8/3	897		REST		4/15	6/14	1095				3,036
1997	7/31	10/5	1083	4/15	6/5	888	6/2	8/3	1081		REST		4/20			3,052
1998[d]	8/2	10/10	946	6/11	8/6	870		REST		4/15	6/13	999				2,815
1999	8/2	11/1	1064		REST		6/11	8/3	963	4/15	6/12	1135	4/20	10/10	57	3,162
2000	8/1	10/5	984	6/5	8/3	1036	4/15	6/6	919	REST						2,939
2001	8/14	9/22	568	6/12	8/1	902	4/2 7/31	4/17; 8/15	514	4/15	6/13	1034				3,018
2002																
2003																
2004																
2005[e]	8/23	9/15	376		REST		7/13	8/23	755	4/15	5/31	855				1,986
2006	8/27	10/4	335	4/16	5/27	685	7/7	8/27	901	5/25	7/7	772				
2007[f]	Crutcher Fire			Crutcher Fire			6/6	10/12	1270	4/17	6/6	914				

Year	Castlehead Pasture[f]			Carter Pasture			Red Basin Pasture			Lambert Pasture			Horse Pasture			Allotment AUMs
	From	To	AUMs	From	To	AUMs	From	To	AUMs	From	To	AUMs	From	To	AUMs	
2008	REST Crutcher Fire			REST Crutcher Fire			REST Crutcher Fire			4/18	7/25	863				863
2009	7/1	9/30	1391		REST			REST		4/19	6/15	849	4/15	9/20	52	2,292
2010	8/18	9/30	736	4/17	5/21	604	6/27	8/18	956	5/21	6/27	669	4/8	9/22	55	3,020
2011																

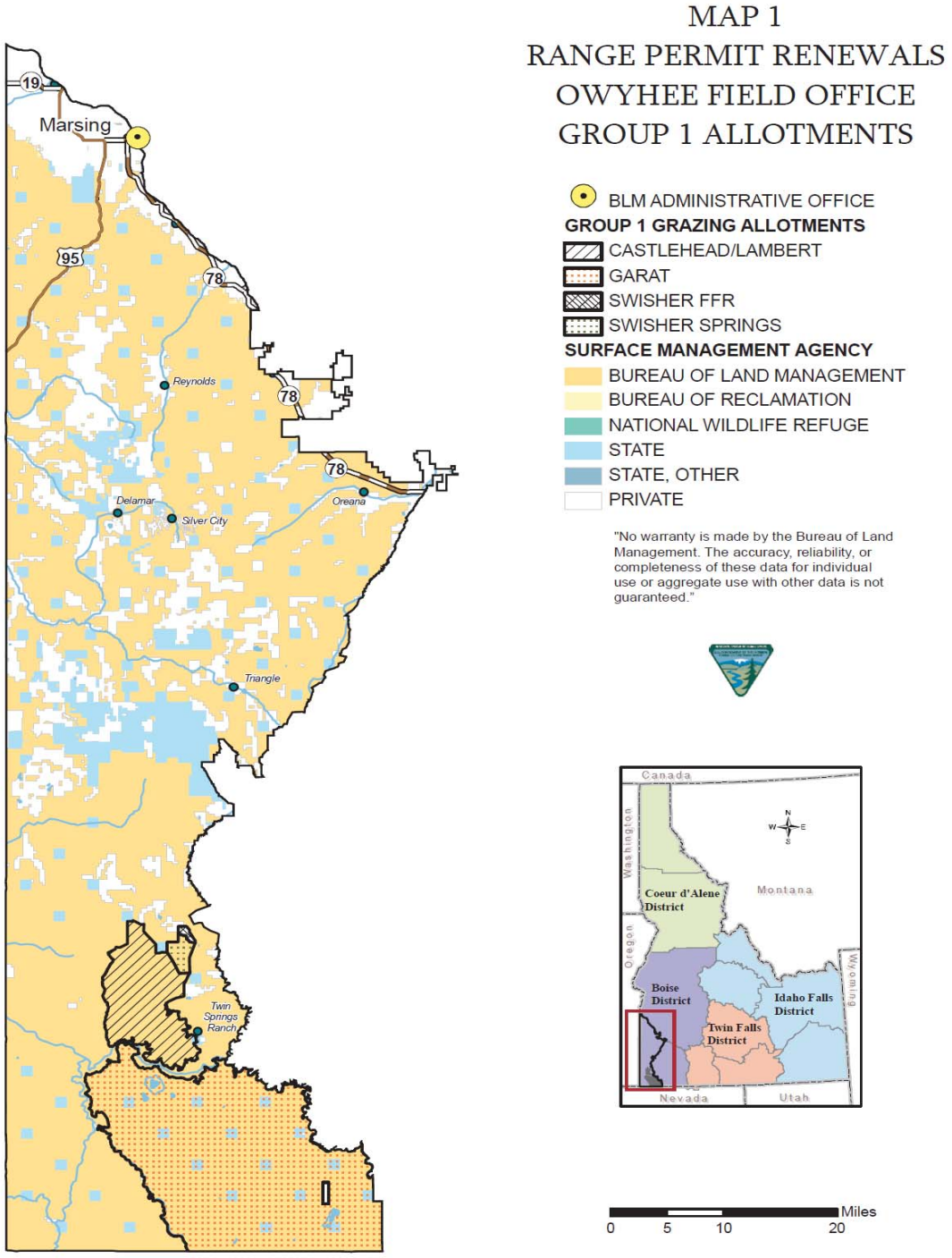
[a] No actual use reported (AUMs are estimated)
[b] No use by M. Stanford (actual use filed)
[c] No report from D. Stanford (AUMs in pastures 2 and 4 are estimated)
[d] No actual use report from M. Stanford
[e] Castlehead pasture divided in 2005 to create pastures 1A and 1B; pastures often used in combination; actual use summarized to include both pastures.
[f] Crutcher Fire ignited 7/7/2007 resulted in cattle scattered in all pastures; all use after 7/7 recorded in Red Basin Pasture.

Table G-2: Percent (%) Key Species Utilization by pasture, 1990-2003

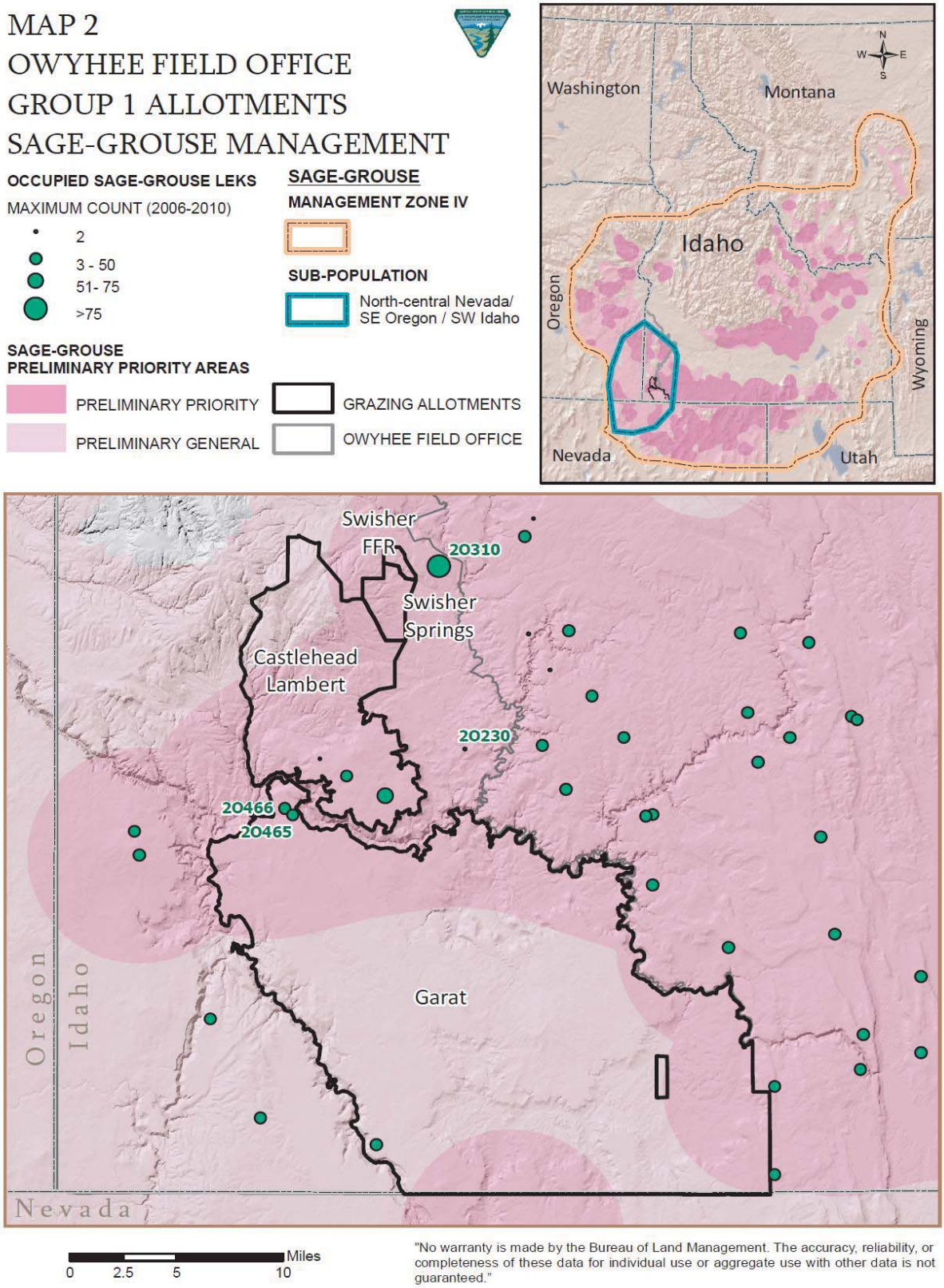
Year	Pasture 1		Pasture 2		Pasture 3		Pasture 4		Pasture 5		Pasture 1		Pasture 6	
	FEID	PSSP	FEID	PSSP	FEID	PSSP	FEID	PSSP	FEID	PSSP	FEID	PSSP	FEID	PSSP
1990					24	48					Pasture 1 (Castlehead) was divided in 2005 to create pasture 1 (Castlehead) and pasture 2 (Between-the-Canyons)			
1991														
1992	60	52			45	43	30							
1993	48		40				35							
1994	58	36	30	40	35	36								
1995	25				37	39	16							
1996			66				32							
1997	32	19	37		63	56								
1998														
1999														
2000														
2001														
2002														
2003														
2004														
2005	pasture split in 2005													
2006														
2007														
2008	pasture 1 (Castlehead)													
2009				5										
2010	pasture 6 (Between-the-Canyons)		5		35	13	10	6						
2011					9		3		41	25	15	10	22	22

Maps

Map 1: Owyhee Field Office Group 1 Range Permit Renewals

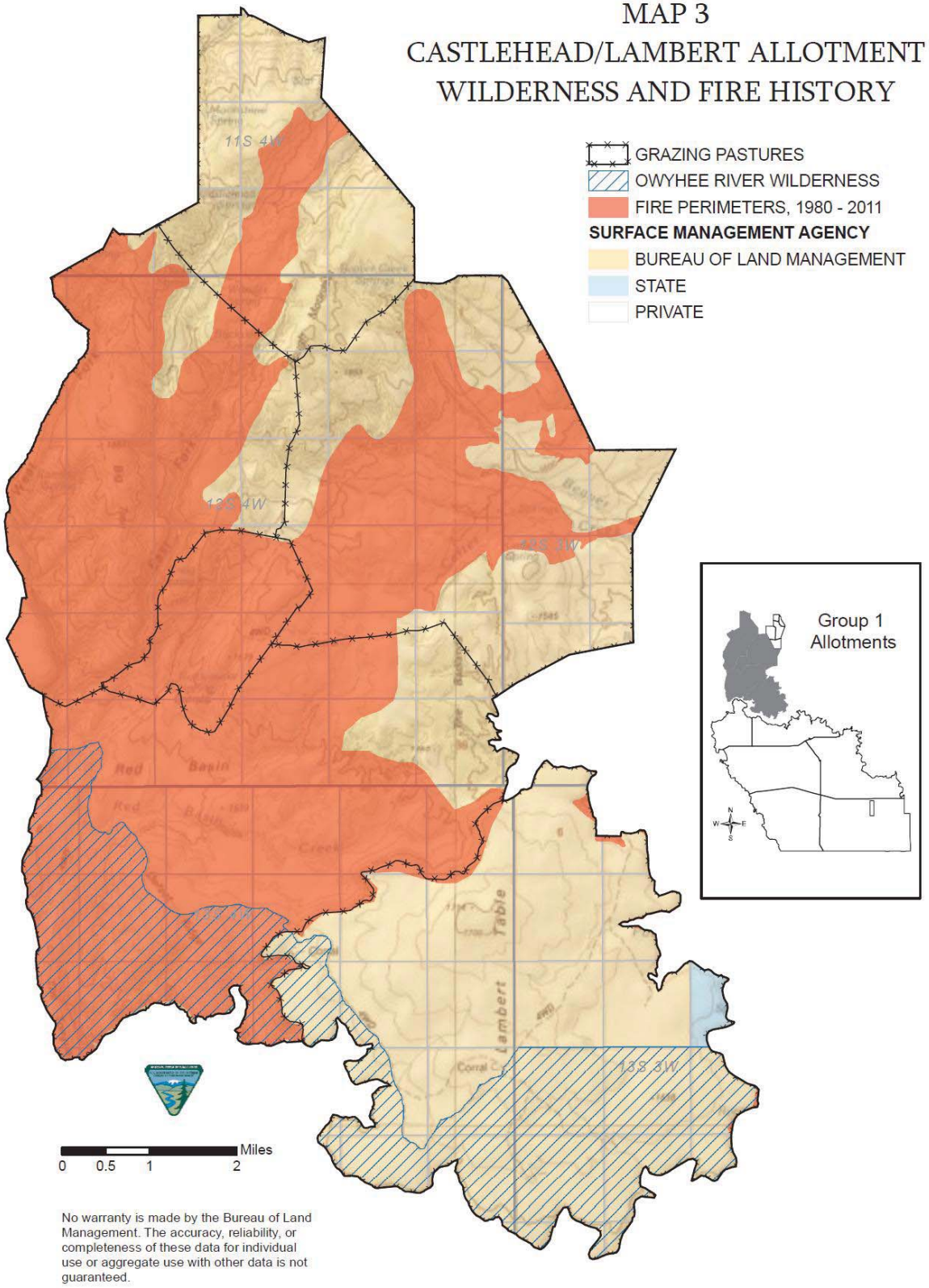


Map 2: Owyhee Field Office Group 1 Sage-grouse Management

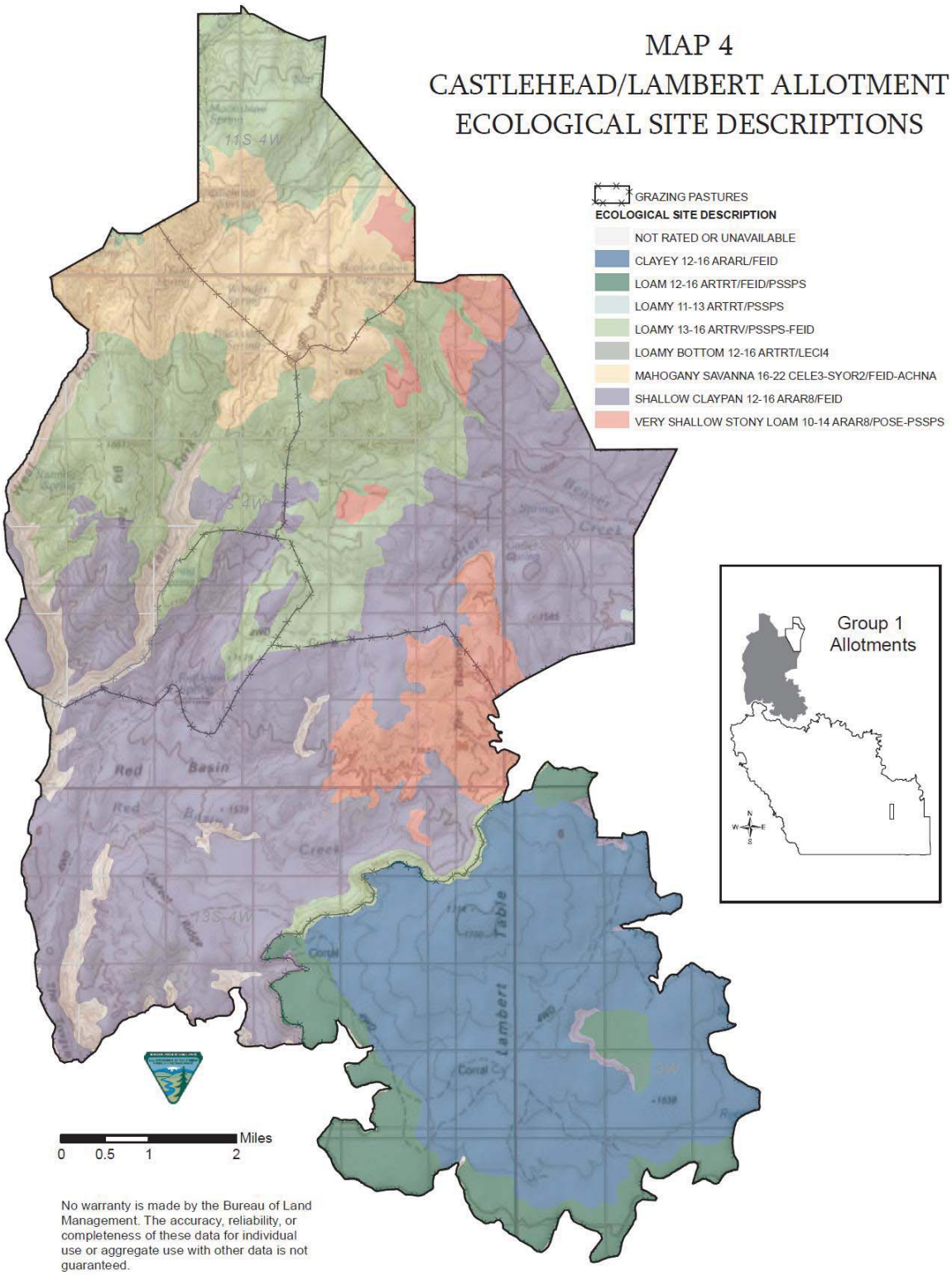


"No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed."

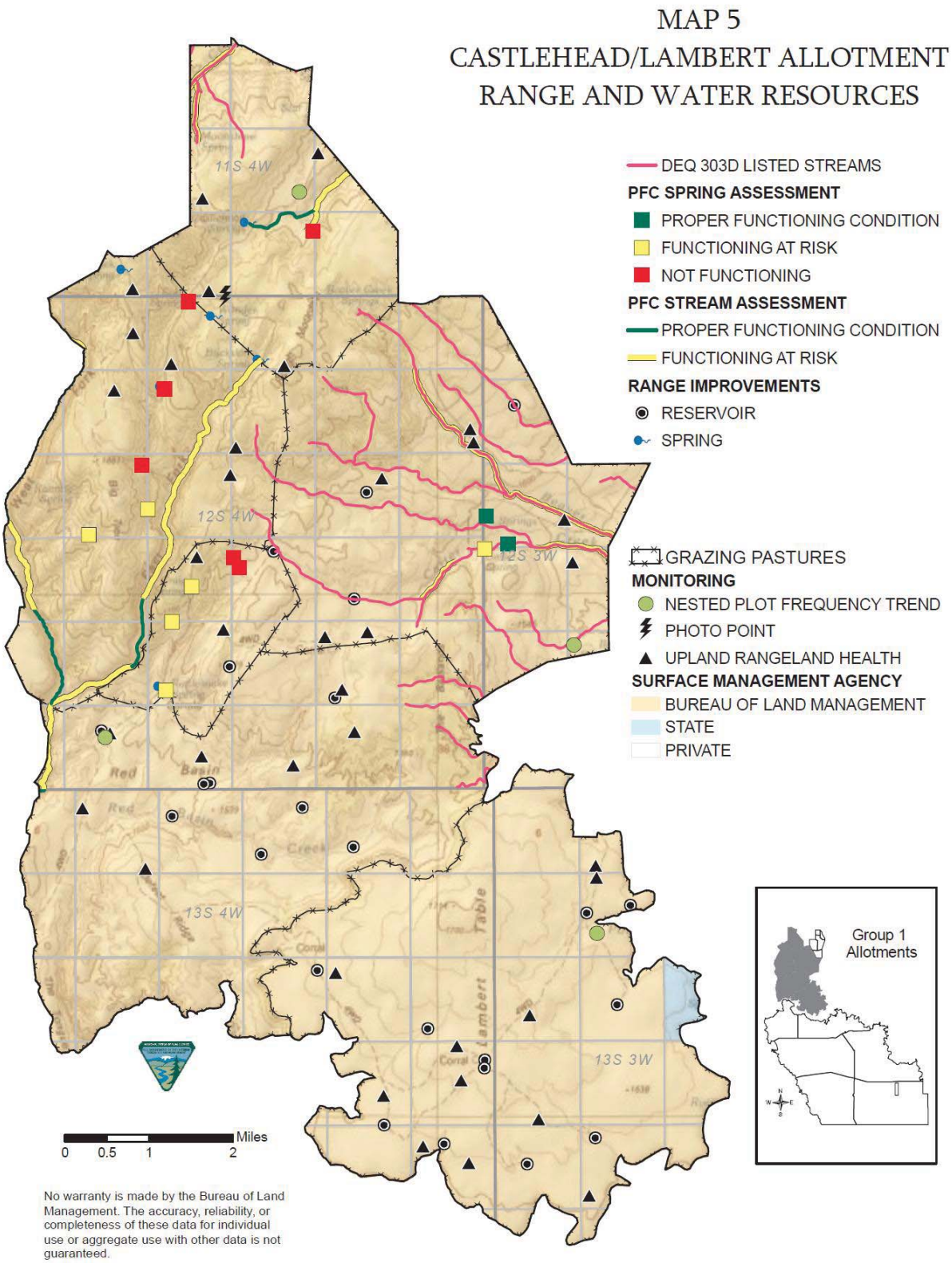
Map 3: Wilderness and Fire History



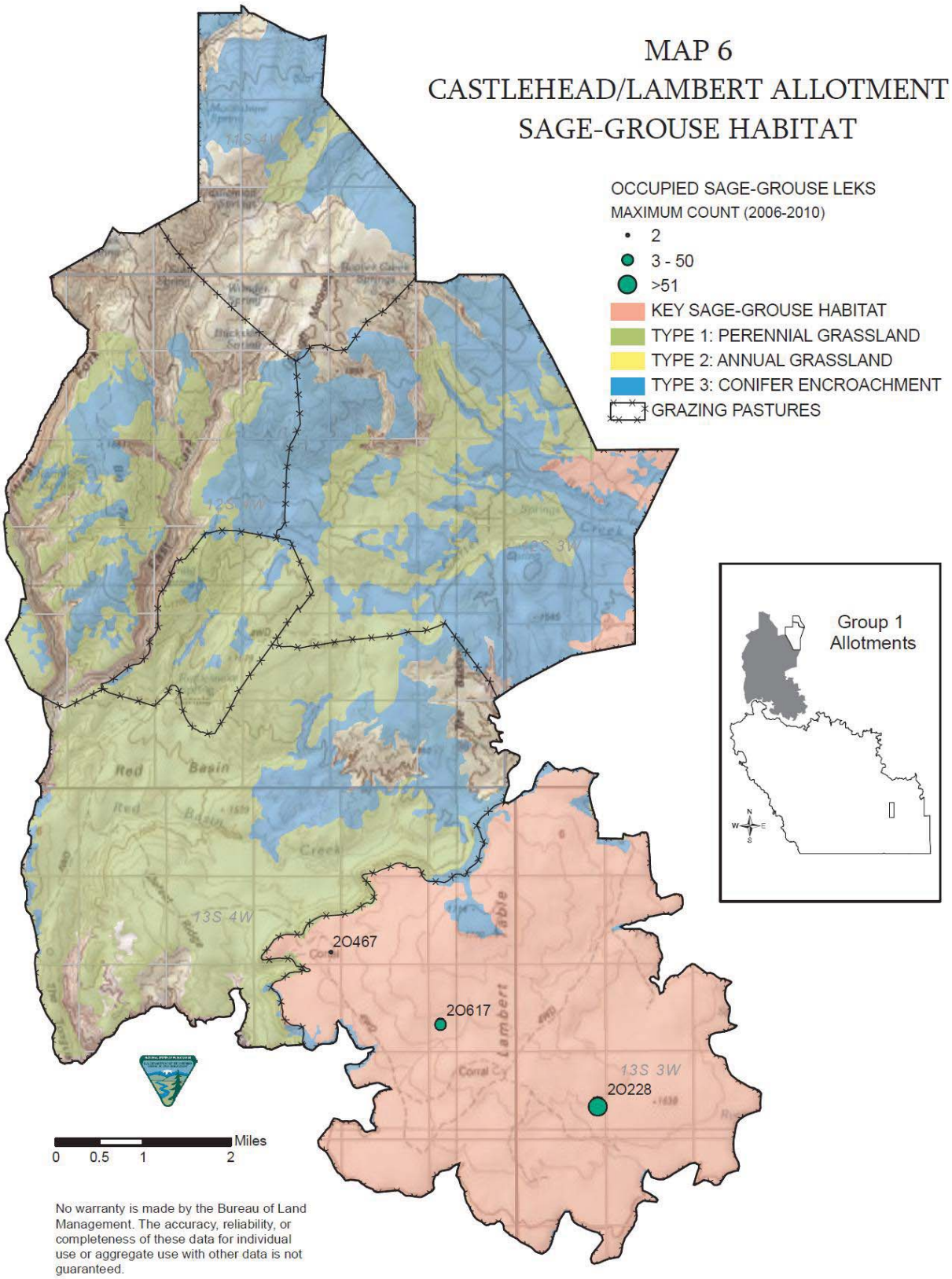
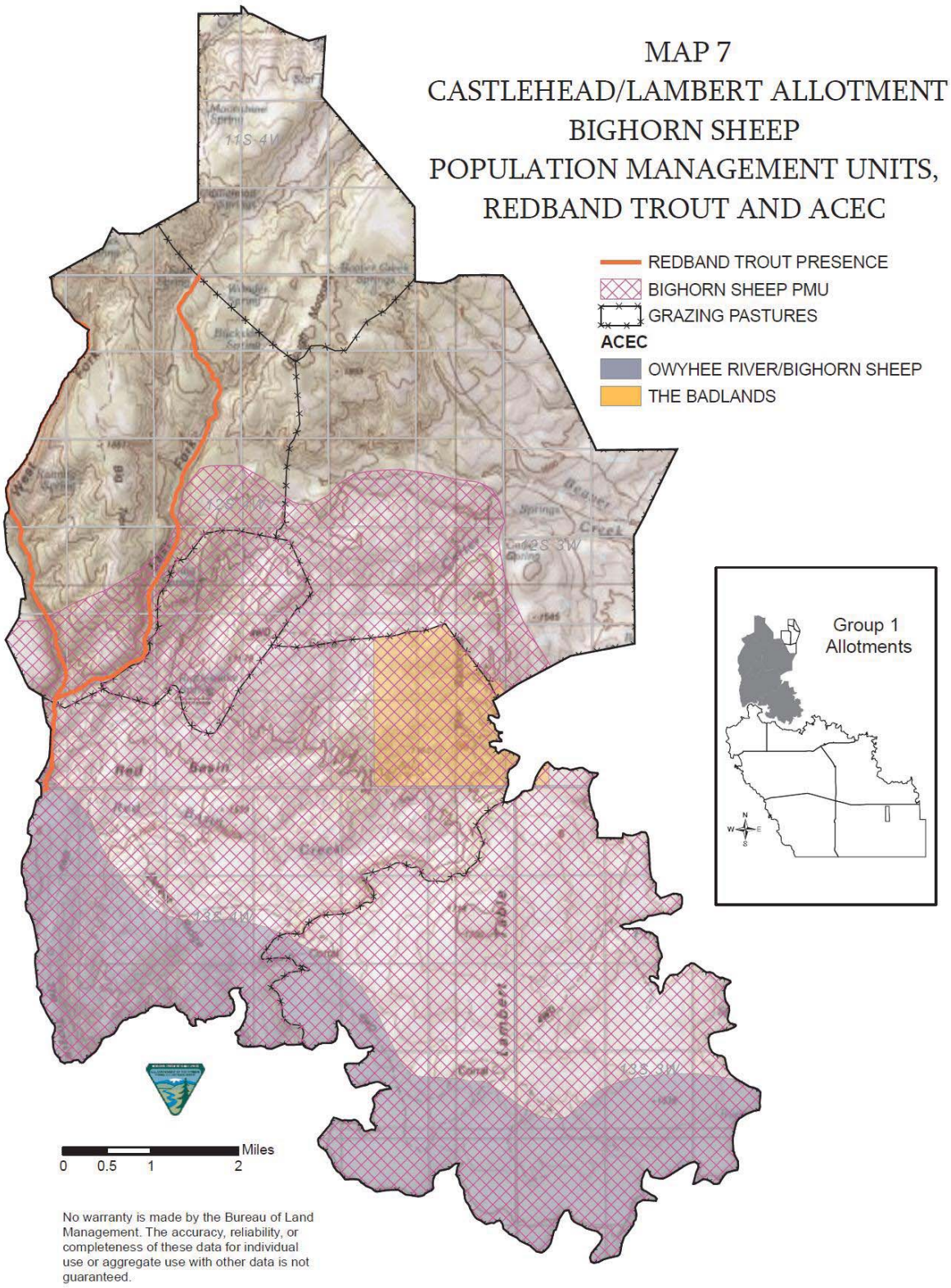
Map 4: Ecological Site Descriptions



Map 5: Range and Water Resources



Map 6: Sage-grouse Habitat



Map 7: Bighorn Sheep Population Management Units, Redband Trout and ACEC