Pole Creek Allotment Permit Renewal
Appendices

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Appendix A. Actual Use and Utilization Data collected on the Pole Creek Allotment

	Pasture AUMs								Overall Utilization	
Year	**1A**	**1B**	**3**	**2**	**TOTAL**		**Use Period**		**1A**	**1B**
1988	843	355			1198		#1A - 6/16 - 8/15, #1B - 8/16 - 9/15		60	56
****1989**				70	70		#2 - 4/15 - 5/15, 9/1 - 9/15			
1990										
1991										
1992	610	627			1237		#1A - 6/15 - 8/8, #1B - 8/2 - 9/30		86	64
1993	627	387		219	1233		#3 - 8/1 - 9/15, #2 - 9/16 - 10/31, #1B - 8/1 - 9/15, #1A - 9/16 - 10/15		16	35
1994	680	680	96		1456		#3 - 6/1 - 6/30, #1A, 1B, 2 - 7/1 - 10/31		13	19
1995	657	658	153		1468		#3 - 6/1 - 6/30, #1A & 1B - 7/1 - 11/30		38	55
1996	658	657	153		1468		#3 - 6/16 - 8/15, #1A & 1B - 7/1 - 10/31			
1997	678	678			1356		#1A& 1B - 7/2 - 10/6			
1998										
1999	643	531			1224		#1B - 7/5 - 8/15, #1A - 8/16 - 9/30, #1A - 10/1 - 10/27 (6 hd.)			
2000	445	444			890		#1A & 1B - 7/1 - 9/30			
2001	431	366	352		1148		#3 - 6/1 - 6/30, #1B - 7/1 -8/1, #1A - 8/2 - 9/5			
2002										
2003										
2004		1212			1212		#1B - 6/1 - 8/15			
2005										
2006	697	704			1401		#1A - 7/1 - 8/15, #1B - 8/16 - 9/30			
2007	549	604			1153		#1A - 7/2 - 8/15, #1B - 8/16 - 9/30			
***2008**	352	352			704		#1A & 1B - 7/17 - 10/28		6	18
2009	415	462			877		#1A - 7/1 - 7/26, #1B - 7/27 - 8/24		20	18
2010	402	502			904		#1A - 7/1 - 7/28, #1B - 7/29 - 9/1		14	27
2011	623	461			1084		#1A - 7/1 - 8/15, #1B - 8/16 - 9/18		21	9
Ave - 1988-2000	649	557	134	145	1281		**Ave - 1988-2000**		43	46
Ave - 1988-2007	627	608	189	145	1265		**Ave - 1988-2007**		43	46
Ave - 1988-2011	564	583	189	219	1177		**Ave - 1988-2011**		30	34
Ave - 2001-2007	559	722	352	0	1229		**Ave - 2001-2007**		NA	NA
Ave - 2008-2011	448	444	0	0	892		**Ave - 2008-2011**		15	18

* No Pasture rotation was shown so use was estimated to be for half of the AUMs in each pasture. Actual use is approximate and was estimated based on memos and phone call records.
** Due to the limited actual use provided in 1989, this data was not used in the "Total" average actual use calculations.
*** Empty cells assume no data was collected and no actual use was submitted, or not enough data was submitted to summarize use.

Estimated Carrying Capacity

	Limiting Factor - Highest Utilization					
	Highest Utilization			Carrying Capacity (50%)		
Year	**1A**	**1B**		**1A**	**1B**	**TOTAL**
1988	60	67		703	265	967
1992	86	89		355	352	707
1993	29	63		1081	307	1388
1994	13	31		2615	1097	3712
1995	42	68		782	484	1266
***2008**	9	32		1956	550	2506
2009	22	25		943	924	1867
2010	18	29		1117	866	1982
2011	22	16		1416	1441	2857
Ave - 1988-2000	46	64		1107	501	1608
Ave - 1988-2007	46	64		1107	501	1608
Ave - 1988-2011	33	47		1219	698	1917
Ave - 2008-2011	18	26		1358	945	2303

Mud Flat SNOTEL Station – Precipitation, in inches

Year	Annual Total	Percent of Average
1982	20.2	115
1983	28.3	161
1984	24.1	137
1985	15	85
1986	18.6	106
1987	14.2	81
1988	17.4	99
1989	12.8	73
1990	16	91
1991	14.9	85
1992	12.6	72
1993	15.6	89
1994	12.3	70
1995	20.7	118
1996	22.3	127
1997	17.7	101
1998	22.2	126
1999	11.9	68
2000	16.9	96
2001	15.8	90
2002	13.8	78
2003	16.7	95
2004	19.3	110
2005	23.4	133
2006	18.9	107
2007	12.6	72
2008	15.6	89
2009	18.1	103
2010	23.2	132
Average:	17.6	

Evaluation and Determination

Pole Creek Allotment

3/1/2012

Interdisciplinary Team:

Chris Robbins – Rangeland Management Specialist
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Background:

The Pole Creek Allotment is located in southwestern Owyhee County, Idaho, approximately 30 miles south of Jordan Valley, Oregon (Map 1). The allotment lies in the Owyhee Mountains on the west side of Juniper Mountain. Elevations range from 4,500 feet near the Dutcher Pasture to over 6,200 feet at Scott Spring on Juniper Mountain. Annual precipitation ranges from approximately 12 to 20 inches. Squaw Creek forms its northern boundary, the southern boundary lies near the Middle Fork Owyhee River, the western boundary is the Oregon/Idaho border, and the top of Juniper Mountain forms a portion of the eastern boundary. Allotment acreages are shown below in Table B1.

Table B1. Allotment Acreages.

Allotment	Pasture Name (Number)	Ownership			Total Acres
		Federal	State	Private	
Pole Creek	Berry Gulch (3)	1,550	0	0	**1,550**
	Horse Flat/	5,458	0	0	**5,458**
	Scott Spring (1B)	3,752	0	0	**3,752**
	Pole Creek Breaks (1A)	11,641	643	41	**12,325**
	Dutcher (2)	994	0	407	**1,401**
Totals		**23,395**	**643**	**448**	**24,486**

An assessment and determination on the Pole Creek Allotment was originally completed in 2001 to determine if Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management were being met. Livestock grazing generally occurred from July through September with approximately 500 cattle from 1988-2007. Average actual use from 1988-2000 was 1,281 AUMs, from 2001-2007 was 1,229 AUMs, and permitted use was 1,468 AUMs.

The BLM entered into a Stipulated Settlement Agreement with Western Watersheds Project on May 15, 2008. This agreement limited livestock grazing to 1,467 AUMs and agreed to the removal of livestock from the pasture or allotment if specified monitoring criteria were exceeded; changes would be made the following year if criteria were exceeded. Livestock grazing was authorized from July through September during this time, but early removal occurred in 2008, 2009, and 2010 for Pastures 1A and 1B, and in 2011 for Pasture 1B only. Livestock were removed at the end of October in 2008 (unauthorized use billing issued), in late August/early September during 2009 and 2010, and mid-September in 2011. Average actual use from 2008-2011 was 892 AUMs. Therefore, current livestock management (as used in this document) is based on early removal from at least one pasture, and actual use of approximately 892 AUMs.

A significant amount of field visits, utilization, trend data, and riparian monitoring (Multiple Indicator Monitoring {MIM} – stubble height, streambank trampling, woody browse, and Proper Functioning Condition {PFC}) has been conducted/collected since implementation of the 2008 Stipulated Settlement Agreement. These data have been used to update, supplement, and replace the data used for the 2001 Assessment/Determination to determine if the allotment is meeting, not meeting, or making significant progress towards meeting the Standards for Rangeland Health (Standards). For Standards not meeting or making significant progress, the causal factor(s) are determined. Information since the 2001 Assessment is discussed in the EA's Affected Environment sections for the applicable resource for each Standard; thus the 2012 Assessment is found in the Affected Environment section of EA # ID-130-2009-EA-3783. This report uses that information, and constitutes a new Evaluation and Determination for the Pole Creek Allotment.

Standard 1 – Watersheds

Overview

Approximately 35% of the allotment is within the North Fork Owyhee watershed, while 65% is within the Middle Fork Owyhee; both are part of the Middle Owyhee Sub-basin. Allotment soils are diverse due to their position on the landscape and parent material sources. These soils occur on foothills, structural benches, and tablelands, and are formed in mixed alluvium and residuum from welded rhyolitic tuffs and breccias. These soils are shallow to moderately deep (with deeper inclusions) and well drained, and generally have xeric soil moisture and frigid soil temperature regimes. The Hat and Cleavage soil series are more representative of the soils in the upper two-thirds of the allotment. These soils are generally loamy with high amounts of coarse fragments both on the surface and in the profile. The Hat, Cleavage, Wickahoney, and Yatahoney soil series are more common in the lower third of the allotment. The Wickahoney and Yatahoney soils are generally more clayey. The water erosion hazard on these soils is generally slight to moderate with the exception of the soils that occur on slopes greater than 30%, which have a moderate to high hazard of erosion from water. However, the amount of rock fragments on the surface can greatly modify the erosion hazard. Wind erosion hazard is low.

Evaluation:

The 2001 Assessment with updated trend, density, utilization, actual use, and juniper cover, as discussed in the EA, are used to evaluate the watershed Standard.

Vegetation is the primary factor that influences the spatial and temporal variability of soil processes and as vegetation condition changes, so does runoff, erosion, and infiltration. The 2001 Assessment identified erosion indicators such as pedestalled bunchgrass and water flow patterns were observed throughout the allotment, but varied in intensity. Microbiotic soil crusts were lacking in areas that usually support the crusts. Areas of bare ground were observed, but were not extensive. Much of the accelerated erosion was related to long-term erosional processes likely caused by historic grazing. Changes to grazing management (fewer AUMs and lower utilization) in 2008 were expected to improve upland vegetation by increasing palatable grass communities and increasing soil cover. However, ground cover comparisons from trend monitoring data showed a reduction in perennial basal vegetation at all five trend sites and an increase in woody plant canopy cover at three of five trend sites between 2000 and 2009. The 2011 Trend Data-Summary and Analysis report identifies that bare ground was mostly stable

between 2000-2009, but non-persistent litter increased significantly, while more durable soil cover elements decreased at three of five trend sites. Although this suggests there has not been an improvement in herbaceous vegetative cover, it may be a function of how the data were collected. Mechanical damage to the soil surface by hoof action is present where livestock tend to congregate (riparian areas, water developments, salting areas or at certain gates). Juniper encroachment is evident throughout the allotment.

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

Evaluation Rationale
Standard 1 is not being met on the majority of the allotment as indicated by the evidence of accelerated soil erosion, decreases in native bunchgrass cover, and juniper encroachment. Signs of accelerated erosion such as water flow patterns and pedestaled bunchgrasses were observed in the allotment. The decrease of the deep-rooted perennial bunch grasses reduces soil cover and litter necessary for soil site stability. Although native plant conditions are expected to improve due to the 2008 change in management and shallow-rooted bunchgrass such as bulbous bluegrass and juniper do provide some surface cover, the data do not indicate significant progress is being made in meeting the Standard. Replacement of mountain big sagebrush by juniper and the continual encroachment of juniper are changing the nutrient cycling, hydrologic cycling, and nutrient flow from what is expected for the area.

Determination:
Standard 1 is not being met throughout the allotment. The primary causes for not meeting the Standard are accelerated soil erosion from past livestock management and the lack of native bunchgrasses/increase in juniper.

Determination Finding: The Pole Creek Allotment is (check one or more):
___ Meeting the Standard
___ Not Meeting the Standard, but making significant progress toward
_X_ Conforms with Guidelines for Livestock Grazing Management
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are Significant Factors
_X_ Not Meeting the Standard; Current Livestock Grazing Management Practices are **not** Significant Factors
___ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s).

Determination Rationale
Accelerated soil erosion such as water flow patterns and pedestalled bunchgrasses were identified throughout the allotment. Reduction of deep-rooted perennial bunch grasses likely due to past livestock grazing (pre-2008) has reduced soil cover and litter necessary for soil site stability and resulted in accelerated soil erosion. Additionally, replacement of mountain big sagebrush with juniper and the continued juniper encroachment has decreased soil cover and litter. Post-2008 grazing management (light utilization at fewer AUMs) is expected to improve vegetation conditions, although this assumption is not validated with the trend cover data to date, because the 2009 trend data only reflect less than two years of changed management. Therefore,

the 2009 trend data have not had enough time to reflect improved soil cover from changes in grazing management.

Standard 2 – Riparian Areas and Wetlands and
Standard 3 – Stream Channel/Floodplain

Overview
About 31 miles of perennial and intermittent streams are in the Pole Creek Allotment. Major drainages include the Middle Fork Owyhee River and its tributaries, Pole Creek, and Squaw Creek and its tributaries. Pole Creek is a tributary of the Middle Fork Owyhee River; and Squaw Creek is a tributary of the North Fork Owyhee River. The majority of the streams in the allotment have perennial surface flows, with approximately 15 miles of stream with intermittent surface flows.

Evaluation:
The 2001 Assessment with updated lotic and lentic PFC assessments, multiple indicator monitoring (MIM) data, herbaceous stubble height, woody browse, and streambank alteration information, found in the 2012 EA, are used to evaluate the riparian areas and wetlands and stream channel/floodplain standards.

Heavy utilization of riparian vegetation (both lentic and lotic) and streambank damage have been observed in areas accessible to livestock before and after the 2008 change in grazing management. Continued hot season grazing has concentrated livestock use on lentic and lotic riparian areas. This level and season of use has affected the streams' functioning condition by decreasing their ability to slow spring flows due to insufficient riparian vegetation, and increasing the channels' width to depth ratios due to insufficient riparian vegetation and increased streambank hoof alterations allotment-wide. Many of the streams within the Pole Creek Allotment are headwaters and influence downstream receiving areas (excess sediment and deposition) in adjacent eastern Oregon.

In addition, juniper encroachment is occurring in and near riparian areas. The encroachment is less than what is occurring in the uplands and has not yet significantly affected the functioning condition of riparian areas and stream channels.

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

Evaluation Rationale
Standards 2 and 3 are not being met in riparian areas accessible to livestock grazing as indicated by heavy herbaceous riparian vegetation use and streambank trampling. Of the 31 stream miles, 36% (11 miles) are meeting Standards and approximately 64% (20 miles) are not making significant progress towards meeting Standards.

Determination:
Due to the hot season use, livestock accessible riparian areas are negatively affected by subsequent heavy utilization and/or streambank/wetland physical disturbance. Conversely, areas that are inaccessible to livestock, either from fencing or terrain, are usually meeting Standards 2 and 3.

Although juniper encroachment is not yet significantly affecting functioning condition of riparian areas and stream channels, the incremental increase in juniper will eventually affect precipitation runoff and increase erosion/sedimentation in the stream channels.

Determination Finding: The Pole Creek Allotment is (check one or more):
___ Meeting the Standards
___ Not Meeting the Standards, but making significant progress toward
___ Conforms with Guidelines for Livestock Grazing Management
_X_ Not Meeting the Standards; Current Livestock Grazing Management Practices are Significant Factors
___ Not Meeting the Standards; Current Livestock Grazing Management Practices are **not** Significant Factors
_X_ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s) **5, 7**

Determination Rationale
Significant progress is not being made towards Standards 2 and 3. Hot season grazing has concentrated livestock in riparian areas, increasing riparian vegetation use and streambank trampling to unacceptable levels.

Juniper encroachment is slowly changing the hydrology of the area by increasing surface runoff and associated sediment input into the stream channels. Due to the degraded riparian conditions on the majority of streams, there will be little buffering capability, and sediment from overland flow would enter stream systems. Unless changes to management occur, in some of the stream systems, rapid runoff coupled with unstable streambanks and general lack of deep-rooted riparian plants would cause channel widening or incision to the point where little soil is left in the riparian areas.

Standard 4 – Native Plant Communities

Overview
Ecological sites are a description of the expected vegetation, based on soils, climate (precipitation and temperature), and a natural disturbance regime. The Pole Creek Allotment is composed of four major ecological sites. They include a loamy mountain big sagebrush/bluebunch wheatgrass and Idaho fescue site, a very shallow stony loam low sagebrush site, a shallow claypan low sagebrush site, and steep rocky canyons.

The ecological sites indicate that, under a natural disturbance regime, the Pole Creek Allotment should be dominated by sagebrush/bunchgrass communities. Other vegetation types, such as juniper and aspen, along with small riparian areas, are expected to occur as unmapped inclusions within the larger ecological sites.

Evaluation:
The 2001 Assessment and the updated trend, density, utilization, actual use, and juniper cover information (as discussed in the Affected Environment for Upland Vegetation/Noxious Weeds in the EA) are used to evaluate current native plant community conditions.

In the loamy mountain big sagebrush sites, sagebrush and other shrubs have largely been replaced by juniper, and large perennial bunchgrasses have been reduced. The herbaceous layer for this ecological site is expected to be dominated by bluebunch wheatgrass and Idaho fescue, but bluebunch wheatgrass is nearly absent and Idaho fescue has been reduced in density. Needlegrass, a medium-sized native bunchgrass, is more common. The remaining native bunchgrasses show acceptable vigor and some recruitment, although quantitative data on trends are lacking. Shallow-rooted bunchgrasses, including the non-native bulbous bluegrass, are more common than expected. Interspatial litter has been reduced.

On the shallow and very shallow soil low sagebrush sites, juniper encroachment has affected some areas, but to a lesser degree than on loamy soil sites, so many stands have adequate low sagebrush cover. Shallow soil sites are expected to be dominated by Idaho fescue, while very shallow sites should be dominated by Sandberg bluegrass and bluebunch wheatgrass. Idaho fescue and Sandberg bluegrass are present, while bluebunch wheatgrass is uncommon. Sandberg bluegrass trends appear stable, but Idaho fescue decreased at three of the five trend sites between 2005 and 2009. Bluebunch wheatgrass declined at one site between 2000 and 2005, but had no significant change between 2005 and 2009. Bulbous bluegrass is widespread, and co-dominant with native bunchgrasses in some stands. Annual invasive grasses are patchy, with cheatgrass and medusahead uncommon, but other annual bromes, such as "Japanese" and rattlesnake, are occasional to frequent in the lower elevations.

Ground cover data show that perennial basal vegetation reduced between 2000 and 2009, while bare ground was mostly stable. Non-persistent litter increased at all five sites, while more durable soil cover elements decreased at three of the five sites between those years. This, however, may be a function of how data were collected. Biological soil crusts are limited in the allotment; ground cover data showed 2%-5% biological soil crust cover in 2000 and only 0.25%-3% cover in 2009 (although the reduction was statistically significant at only two of the five sites).

Grazing management changes since 2008 (reduced actual use and utilization due to early removal from each pasture) would be expected to show improved herbaceous vegetative conditions. However, 2005 and 2009 trend data do not show improvements, with conditions static or some indicators declining. This expected improvement is not evident in trend data because: 1.) Only one year of revised management was reflected at the time of monitoring, and 2.) High juniper density, along with bulbous bluegrass and other weeds in localized areas, continue to affect the plant community.

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

Evaluation Rationale:
Standard 4 is not being met on the loamy big sagebrush sites as indicated by the widespread replacement of mountain big sagebrush by juniper, and the reduction in large perennial bunchgrasses. It is also not being met on some low sagebrush sites as indicated by localized replacement of low sagebrush by juniper, and pockets of reduced large bunchgrasses and invasive grasses. This Standard is not being met on an estimated 30% of the low sagebrush areas

within the allotment. Although improvement in native plant conditions are expected following recent reductions in use, the data do not indicate significant progress is being made in meeting the standard, primarily because of continued juniper encroachment and localized invasive grasses.

Determination:
Standard 4 is not being met in most of the loamy big sagebrush sites, and in a portion of the low sagebrush sites. The primary causes for not meeting the Standard are juniper encroachment and past (pre-2008) grazing management.

Determination Finding: The Pole Creek Allotment is (check one or more):
___ Meeting the Standard
___ Not Meeting the Standard, but making significant progress toward
_X_ Conforms with Guidelines for Livestock Grazing Management
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are Significant Factors
_X_ Not Meeting the Standard; Current Livestock Grazing Management Practices are **not** Significant Factors
___ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s).___

Determination Rationale
Within the Pole Creek Allotment, juniper cover has increased to 45% of the allotment, compared to 8% expected under a natural disturbance regime. In the loamy big sagebrush sites, sagebrush and other shrubs have largely been replaced by juniper, so encroachment (the current density and cover of juniper) is the primary factor in this plant community structural change. Juniper encroachment has affected limited areas in low sagebrush communities, and has also affected somewhat native bunchgrass density, but to a lesser degree than its effect on shrubs.

The reduction in large perennial bunchgrasses, primarily bluebunch wheatgrass and, to a lesser degree, Idaho fescue, is largely a result of past grazing management. Moderate or higher utilization between 1988 and 2007 (and probably earlier, although no data is available), grazing during the critical growing season, at least for higher elevation sites, and no rest have caused a reduction in the density of the largest, most palatable native bunchgrasses. Later season use of the low elevation low sagebrush sites, primarily after the critical growing season, has resulted in less impact to large bunchgrasses on these sites.

Although higher elevation, loamy sites are grazed in part during the growing season, the relatively light utilization is not likely to be a significant factor in affecting Standard 4. Current grazing management (assuming use from approximately July 1 to July 26 in Pasture 1A and July 27 to August 31 in Pasture 1B for about 892 total active AUMs) is not significantly affecting native upland plant communities. This is because upland utilization is light, the grazing period is relatively short, and much of the use occurs after the critical growing season, at least for low elevation low sagebrush sites.

Invasive grasses that affect parts of the Pole Creek Allotment include bulbous bluegrass, invasive annual bromes, and other grasses. Patches of these weedy grasses affect native bunchgrass recruitment in localized areas, and thus influence Standard 4 there, but the effect on the

allotment, as a whole, is not significant on the landscape scale because of the relatively low proportion of area affected.

Standard 5 – Seedings

Not Applicable

Standard 6 – Exotic Plant Communities, Other than Seedings

Not Applicable

Standard 7 – Water Quality

Overview

Streams with designated beneficial uses are addressed under the Idaho Administrative Procedures Act (IDAPA) 16.01.02.140. All streams within the Pole Creek Allotment have general use designations for secondary contact recreation, agricultural water supply, wildlife habitat, and aesthetics. The Middle Fork Owyhee River has been assigned additional uses, including domestic water supply, cold water biota, salmonid spawning, primary contact recreation, and special resource water. Squaw Creek also has additional beneficial uses of cold water biota and salmonid spawning.

The Idaho Department of Water Quality (IDEQ) identified the Middle Fork Owyhee River was not supporting cold aquatic life and salmonid spawning beneficial uses. Consequently, the Middle Fork Owyhee River from the headwaters to the Oregon/Idaho state line is on the State of Idaho's 303(d) list as water quality limited due to flow alteration and thermal modification. Total maximum daily loads (TMDLs) were developed for stream temperature in the Middle Fork Owyhee River. The State of Idaho recently determined that the water quality standard in the Middle Fork Owyhee River and Squaw Creek is being met (de-listed) for sediment/siltation. Squaw Creek was also de-listed for thermal modification. Squaw Creek and a 1.5 mile reach of Pole Creek have been identified as meeting all of their beneficial uses, as reported by IDEQ's 2010 Integrated Report.

Evaluation:

The 2001 Assessment with 2010 IDEQ water standard information, continuous water temperature data, *Escherichia coli* (*E. coli*) concentrations, and riparian data such as PFCs and MIMs are used to evaluate the water quality standard.

Thermal modification in the Middle Fork Owyhee River and Scott Spring Creek and their tributaries is likely due to the loss of shade-producing vegetation such as shrubs and herbaceous grass-like species along streambanks. Additionally, streambank alteration caused by livestock (trampling, pugging, shearing, etc.) increases stream width and decreases depth, thereby exposing more water to solar radiation and increasing water temperature.

Although the Middle Fork Owyhee River and Squaw Creek have been removed from the 303(d) list ("de-listed") for sediment/siltation, excessive sedimentation is still likely occurring from these and other streams accessible to livestock due to the poor riparian conditions. The major sediment contributor is unstable, eroding streambanks resulting from excessive livestock use and juniper

encroachment. Excessive bank alterations from livestock trampling, pugging, and shearing exposes bare soil and increase the likelihood for sedimentation.

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

Evaluation Rationale
Standard 7 is not being met due to findings from IDEQ identifying Middle Fork Owyhee River is not meeting all of its beneficial uses and the Middle Fork Owyhee River is on the 303(d) list as water quality limited due to flow alteration and thermal modification. In addition, other streams within the allotment are likely not meeting water quality standards due to poor riparian conditions and excessive streambank alterations that contribute to increased water temperatures and sedimentation.

Determination:
Waters within the Pole Creek Allotment are not meeting Standard 7 and livestock grazing is a significant factor. Hot season grazing concentrates livestock in the riparian areas, causing heavy utilization and/or streambank/wetland physical disturbance.

Although juniper encroachment is not yet significantly affecting water quality, the incremental increase in juniper will eventually affect precipitation runoff and increase erosion/sedimentation in the stream channels, increasing turbidity and stream temperatures.

Determination Finding: The Pole Creek Allotment is (check one or more):
___ Meeting the Standard
___ Not Meeting the Standard, but making significant progress toward
___ Conforms with Guidelines for Livestock Grazing Management
_X_ Not Meeting the Standard; Current Livestock Grazing Management Practices are Significant Factors
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are **not** Significant Factors
_X_ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s) **10**

Determination Rationale
Hot season grazing has concentrated livestock use in riparian areas, resulting in reduced riparian zone buffering capacity and increased sedimentation and stream temperatures. Thermal modification due to the loss of shade-producing vegetation, such as shrubs and herbaceous grass-like species along streambanks is occurring. Additionally, sediment deposits from streambank alterations (i.e., trampling and shearing) has increased fine sediment yield, leading to hydraulic disequilibrium, reduced sediment transport capacity, and eventually increased stream width, aggradation, and decreased depth, which exposes more water surface to solar radiation. Water temperatures increase, and streams are likely to be more turbid and sediment laden.

Juniper encroachment slowly changes the hydrology of the area by increasing surface runoff and associated sediment input into stream channels. Due to the majority of the streams' degraded riparian conditions, there is little buffering capability, and sediment from overland flow freely enters stream systems. In some of the stream systems, rapid runoff, coupled with unstable

streambanks and the general lack of deep-rooted riparian plants, causes channel widening or incision to the point where little soil is left in the riparian areas.

Standard 8 – Threatened and Endangered Plants and Animals

Overview

Special Status Animals

The Pole Creek Allotment is located within the Owyhee Uplands and Canyons and Semiarid Uplands Level IV Ecoregions of Idaho. Within the allotment, these ecoregions are characterized by rolling shrub steppe uplands interrupted by low hills, rocky outcrops and precipitous river canyons. Wildlife habitats within the Pole Creek Allotment include juniper woodlands, mountain shrublands, sagebrush steppe, grassland meadow complexes, riparian areas, springs and seeps, and a few small reservoirs. Many wildlife species utilize a variety of habitats in the allotment. These habitats provide forage, nesting substrate, and cover for a variety of bird, mammal, amphibian, reptile, and fish species common to southwestern Idaho and the Northern Great Basin region.

No Threatened and Endangered Species listed under the Endangered Species Act (ESA) occur in the allotment. However, two bird and one amphibian species listed as candidates under the Endangered Species Act, and 11 mammals, 25 birds, and one fish with BLM special status (including Watch List Species) potentially may occur within the allotment. Special status wildlife species, their status, and key habitat associations and current information regarding habitat conditions and occurrence potential within the allotment are explained in detail in the Affected Environment for Fish and Wildlife Section in the EA. Special status wildlife information is based on field surveys conducted in the Pole Creek Allotment in 2010, BLM records, and data on file with the Idaho Fish and Wildlife Information System.

Botany

Two BLM special status plant species are recorded within the Pole Creek Allotment. Thinleaf goldenhead (*Pyrrocoma linearis*) and harlequin calicoflower (*Downingia insignis*) are Type 3 BLM sensitive plants, considered range-wide or State-wide imperiled with moderate endangerment. Special status plant information is based on botanical surveys conducted in the allotment in 2010 and 2011, BLM records, and data on file with the Idaho Fish and Game Plant Conservation Database.

Evaluation:

Special Status Animals

The 2001 Assessment with current terrestrial and aquatic wildlife occurrence data and updated upland, riparian, and stream channel/floodplain information relevant to habitat conditions, as discussed in the EA, are used to evaluate the threatened and endangered wildlife Standard.

Upland wildlife habitats within the allotment have departed substantially from what would be expected under a natural disturbance regime. Sagebrush steppe communities that would be expected at higher elevations in the Pole Creek Breaks and Scott Springs Pastures based on ecological site descriptions have been predominantly converted to juniper woodlands. The increase in juniper cover may have benefited some woodland associated species such as northern goshawks, Lewis' woodpeckers and Cassin's finches. Conversely for these species, juniper encroachment is threatening riparian areas and aspen stands limiting the amount of nesting and foraging habitat they species require.

The conversion to juniper woodlands has certainly reduced the quantity and quality of habitat for a variety of shrub-obligate species including greater sage-grouse, sage sparrows, and Brewer's sparrows. At lower elevations within the Dutcher, Horse Flat and Berry Gulch Pastures sagebrush habitat persists with varying amounts of juniper encroachment. Livestock use in these areas predominantly occurs after the growing season and although desirable perennial bunchgrass species like bluebunch wheatgrass and Idaho fescue are uncommon or occurring at lower densities than expected, suitable habitat conditions exist for many shrub-obligate species. Nevertheless, sagebrush steppe habitats within these pastures will continue to be degraded as junipers are established and increase in density, and perennial bunchgrasses are replaced by non-native perennials and exotic annuals that do not provide the same quality of cover.

In areas accessible to livestock, lentic and lotic riparian wildlife habitats lack sufficient vegetative cover, deep-rooted vegetation, and species diversity. These highly degraded habitats are due to hot season grazing which has concentrated livestock use in riparian areas and resulted in heavy riparian vegetation utilization. Heavy utilization has reduced forage, nesting substrate, and cover for riparian dependent species migratory songbirds and special status species such as calliope hummingbird and willow flycatchers. In these areas, instream aquatic habitats are subject to increased temperatures due to the loss of shade producing vegetation such as shrubs and herbaceous grass-like species along streambanks. Additionally, streambank alteration caused by livestock (trampling, pugging, shearing, etc.) increases stream width and decreases depth, thereby exposing more water to solar radiation and increasing water temperature. Livestock trampling is riparian areas also increases sediment loads to aquatic habitats. These factors are decreasing the quantity of lentic habitats for spotted frog reproduction and limiting suitable habitat for redband trout by degrading lotic habitats in Squaw Creek and Middle Fork Owyhee River.

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

Evaluation Rationale
Standard 8 (special status animals) is not being met on higher elevation upland habitats due to juniper encroachment and conversion to woodlands. These woodland habitats are unsuitable for shrub-obligate species that would be present in the expected shrub steppe habitat. Although lower elevation upland habitats may be providing marginal habitat for shrub-obligate species, the continuation of juniper encroachment and localized increases of invasive grasses at the expense of desirable perennial bunchgrasses will lead to further degradation of nesting and foraging conditions. In addition, Standards 8 (special status animals) is not being met in riparian areas accessible to livestock grazing. Heavy herbaceous riparian vegetation use and streambank trampling has reduced nesting substrate, protective cover, and foraging areas for many riparian-dependent species. Heavy use and trampling in riparian areas also has increased stream temperatures, channel width to depth ratios, and sediment loads which degrade limit suitable habitat for aquatic species such as amphibians and fish.

Botany
Recent observations suggest that current grazing management is not significantly impacting thinleaf goldenhead occurrences, presumably because the Horse Flat Pasture is generally used after mid-July, by which time flowering is typically complete and fruiting is underway. Also, this plant's growing points are at or below ground level, making it somewhat resilient to grazing and trampling effects after seed set.

The harlequin calicoflower occurrence (or suitable habitat near the recorded location) has not been relocated since the 1983 collection, so observations on grazing and trampling effects on this plant are lacking in this allotment. No lentic sites are known to occur on public lands in the Dutcher Pasture; therefore, it unlikely that harlequin calicoflower occurs there. It is unknown if the population is extant or if livestock are presently having any impacts on the plants or habitat. Cattle are typically drawn to this habitat type since it is a water source. Livestock impacts to this genus have been documented elsewhere, as a result of trampling when the soil was wet, although plants can apparently persist in areas subjected to some trampling, at least in the short term.

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

Determination:
Special Status Animals
Standard 8 (special status animals) is not being met throughout the allotment and livestock grazing is a significant factor in riparian areas. Hot season grazing concentrates livestock in the riparian areas, causing heavy utilization and streambank/wetland physical disturbance which limits or excludes use by species dependent on these habitats. Although current livestock use does not appear to be a significant factor, Standard 8 (special status animals) is not being met in upland habitats due to historic livestock use which has reduced perennial bunchgrasses and juniper encroachment which has converted the expected sagebrush steppe communities to woodlands. Reductions in perennial bunchgrasses limit cover and foraging areas and drastic changes in plant communities typically are concomitant with changes in wildlife communities.

2011 Determination Finding: The Pole Creek Allotment is (check one or more):
___ Meeting the Standard
___ Not Meeting the Standard, but making significant progress toward
___ Conforms with Guidelines for Livestock Grazing Management
_X_ Not Meeting the Standard; Current Livestock Grazing Management Practices are Significant Factors
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are **not** Significant Factors
_X_ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s). **5, 6, 8, 12**

Determination Rationale:
Special Status Animals
Within the Pole Creek Allotment, juniper cover has increased substantially. Higher elevation upland habitats have been replaced by juniper woodlands. Woodland habitats do not provide the

proper biological and structural plant community shrub-obligate species such as greater sage-grouse and sage sparrows require. Another important upland habitat component, large perennial bunchgrasses, has been reduced as a result of past grazing management. Decreased perennial bunchgrasses and juniper encroachment have diminished the quality of lower elevation upland habitats by reducing cover and foraging areas for many species of birds and small mammals.

Hot season grazing has concentrated livestock in riparian areas. Heavy utilization in riparian areas has reduced vegetation that provides nesting substrate, protective cover, and foraging areas for many riparian-dependent bird species. Reduced cover and streambank trampling in riparian areas (lotic and lentic) due to heavy utilization by livestock increases water temperatures and sediment loads and reduces water quality. Spotted frog habitat quality is degraded by sedimentation which reduces breeding pool depths; aquatic habitat quality for fish such as redband trout also is degraded by sedimentation which can cover spawning substrates and redds and negatively affect reproduction. Reduced shade from the lack of riparian vegetation allows greater solar radiation to reach the affected wide and shallow streams, potentially surpassing temperature thresholds and precluding use by aquatic species.

Botany
Based on the limited available information on special status plants, Standard 8 is being met for thinleaf goldenhead and, probably, for harlequin calicoflower.

2011 Determination Finding: The Pole Creek Allotment is (check one or more):
_X_ Meeting the Standard
___ Not Meeting the Standard, but making significant progress toward
_X_ Conforms with Guidelines for Livestock Grazing Management
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are Significant Factors
___ Not Meeting the Standard; Current Livestock Grazing Management Practices are **not** Significant Factors
___ Does not conform with Guidelines for Livestock Grazing Management Guidelines No(s).

Determination Rationale:
Botany
Standard 8 is being met for thinleaf goldenhead because under current management, grazing on its habitat occurs after the critical growing period. Recent information on harlequin calicoflower is incomplete, but it is likely that current use (assuming early removal) is not significantly affecting the occurrence because it has the opportunity to set at least some seed before the grazing period.

Summary of Evaluation and Determination

	Standards							
Check one box for each	1	2	3	4	5	6	7	8
	Watersheds	Riparian	Stream Channel	Native Plant Communities	Seedings	Exotics (not seeded)	Water Quality	T& E
Meeting the Standard								X (botany)
Not Meeting the Standard, but making **significant progress** toward								
Not Meeting the Standard; current livestock grazing practices **are not** significant factors	X			X				
Not Meeting the Standard; current livestock grazing practices **are** a significant factor		X	X				X	X (special status animals)
Not Meeting the Standard; cause not determined								
Standard does not apply					X	X		
Guidelines for Livestock Grazing								
Conforms with Guidelines for Livestock Grazing Management?							**No**	
If no, list the Guidelines not in conformance: **5, 6, 7, 8, 10, 12**								

/s/ *Loretta V. Chandler* 03/01/2012
Field Manager's Signature and date

Appendix C. BLM response to comments received from the July 30, 2009 scoping document for EA #ID-130-2009-EA-3783 Term Permit Renewal for Livestock Grazing in Pole Creek Allotment.

The following guidelines were used by Owyhee Field Manager and Pole Creek Allotment Interdisciplinary (ID) Team in considering, reviewing, and responding to Scoping Document comments. Relevant comments were either:

1) considered pertinent suggestions which could be incorporated into the alternatives;
2) considered as Other Alternatives Considered, but not analyzed;
3) considered as issues to be addressed in the effects analysis;
4) considered as indicators of where BLM needed to provide better clarification in the environmental assessment; or,
5) considered concerns in which BLM provided a specific response, in this Appendix.

The Pole Creek Allotment ID Team reviewed Scoping Comments received from the following:

- Western Watershed Projects, Katie Fite received via email on August 26, 2009.
- Western Watershed Projects, Katie Fite received via email on August 31, 2009.
- Idaho Department of Fish and Game received via email on August 31, 2009.
- Western Watershed Projects received via fax/email on September 22, 2009.

Comments which were categorized under Guidelines No. 1-4 above have been considered and/or addressed in the final EA. The following responses address comments which were categorized as Guideline No. 5 above.

Western Watershed Projects – August 26, 2009, Comments:

1. *Please systematically collect adequate baseline data on the current health of these lands, watersheds and waters, and the role of livestock as a causal agent in: any habitat, hazardous fuels, understory depletion, desertification, rangeland health, woody species "invasion" and other problems that may exist on these lands. There is no evidence that this has been done in a comprehensive way.*

   Baseline data used for this analysis come from a variety of sources of the best available science, well within BLM's standard procedures. Primary information sources include:
   - Pole Creek Rangeland Health Assessment summary (2011) (within EA # ID-130-2009-EA-3783)
   - Pole Creek Evaluation/Determination of Rangeland Health (2011)
   - Pole Creek Rangeland Health Assessment summary (2001)
   - Pole Creek Determination of Rangeland Health (2001)
   - Rangeland Trend data from 1997-2009
   - Utilization data (1988, 1992-1995, 2008-2011)
   - Actual use, based on the permittee's yearly actual grazing use reports (1988, 1992-2001, 2004, 2006-2011)
   - Riparian MIM data collected (2008-2011)
   - Properly Function Condition – Lotic and Lentic Assessments (2006)

- Riparian Greenline Transects (2004)
- Corporate GIS layers (vegetation, ecological sites, springs, fire history, etc.)
- Academic studies specific to this area – Bunting 2007, Miller 2004, Furniss 1985, etc.
- Extensive relevant literature - see Literature Cited.
- Resource-specific field surveys (ex: Botany 2010 & 2011, Archaeology 2009-2011, Juniper & understory density plots 2009, Goshawk Surveys 2010).
- NRCS (Natural Resources Conservation Service) Ecological Site Descriptions
- Idaho's Conservation Data Center (for known rare plant and animal locations)

2. *Restoration of native vegetation communities and ecological processes must be the goal of all treatments. Restoration means restoring and maintaining ecological integrity. Ecological integrity is the ability of an ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity and functional organization comparable to that of natural habitats within the region.*

   We agree, and the management actions developed for the various alternatives reflect that.

3. *We believe that until effective answers are found for the vexing problems of noxious weeds and exotic annual grasses, a cautious and prudent fire suppression plan must be in place. This is also necessary because of the dramatically altered and unnatural condition of many sites caused by 150 years of livestock grazing. We ask that you develop a full range of actions based on a precautionary approach.*

   The risk of noxious and invasive weed infestations associated with wild and prescribed fire is addressed in the 2010 Boise District Fire Management Plan for the Fire Management Units throughout the Boise District. This EA analyzes a range of alternatives including no prescribed fire and a combination of cutting and prescribed fire.

4. *Due to drought, insect infestations, climate change, grazing degradation/desertification of sites, there have been recent large-scale die-offs of pinyon, and increasingly western juniper, aspen, and sagebrush in many western lands. Western juniper in the Owyhees is now suffering from die-offs in some areas – something that had not been observed up until a few years ago. WWP has raised this issue repeatedly and BLM has not addressed it.*

   BLM has addressed these WWP claims in the past, and found no evidence to support them. To date, no substantial die-offs of western juniper have occurred or are occurring in the Owyhee Uplands. In 2002-2003 BLM personnel observed some individual juniper trees which appeared to be topped or killed by bark beetles. BLM was not able to find any information about these beetles. This infestation was rare and has not diminished the unprecedented expansion of western juniper. BLM knows of no other insects, fungus, or diseases affecting juniper. Aspen and sagebrush health issues in this area are strongly related to shading and competition effects of juniper, and the alternatives incorporating juniper management are intended to restore long-term health of those species by treating the juniper.

5. *The role of continued livestock grazing post-treatment in continuing weed invasion must be addressed – how will this foreseeably increase the chemicals used?*

   Livestock grazing does affect the potential for weed invasion; see the environmental effects discussion. The amount of livestock use proposed is not more than has occurred in the past, so an increase in the rate of weed invasion is not expected, and no significant increase in chemical treatment of noxious weeds is anticipated. Chemical treatment of noxious weeds is covered in the District's noxious weed EA and is beyond the scope of this analysis.

6. *Current agency enforcement of grazing closure restrictions is often lax. The problems of dealing with trespass livestock are enormous. Thus, we have no assurances that any livestock-related post-treatment measures will be followed, and these cannot be used as "mitigation" for treatments.*

   The Owyhee Field Office takes appropriate action when unauthorized livestock grazing (trespass) occurs, in accordance with 43 CFR 4140.1 (Acts Prohibited on Public Lands). The Field Office has pursued several trespasses in the last few years, completed a livestock impoundment in February 2011, and will continue to take appropriate action when unauthorized livestock grazing is identified.

7. *Please develop a comprehensive monitoring plan, with all monitoring to be funded as part of the original "treatment" cost over an extended period of time. Otherwise, timely and necessary monitoring will never occur.*

   Upland monitoring will be in accordance with the Idaho Minimum Monitoring Standards and IM ID-2008-022 (USDI, BLM 2008). Riparian monitoring will occur on the same 3-5 year cycle as the upland trend monitoring, and as funding permits. See Section 2.2.1 in the EA. Additionally, Alternative A1 would require mid-season stipulated agreement indicator monitoring, and Alternative B would require annual indicator monitoring for adaptive management.

8. *What is meant by "encroached", or "invaded", and what is the evidence of this?*

   Juniper encroachment or invasion into sagebrush, aspen, and mahogany stands is defined as the expansion of its range and increase in density since about 1870 (post-settlement), caused primarily by the disruption in the natural fire cycle. The evidence of this encroachment is discussed exhaustively in the EA. Appendix F provides photographic evidence.

<u>Western Watershed Projects – August 31, 2009, Comments</u>:

9. *The BLM documents are not Scoping. Each is a fully fleshed out proposal for continuing gross and abusive overstocking of the public lands. It was clearly worked out to overwhelmingly benefit a single permittee at the expense of ALL the other important values of the public lands.*

BLM manages the public lands for multiple use, not a single use. The purpose of a scoping document is to notify the public and solicit their comments on a proposed action. As such, a scoping document needs to contain enough information to provide for meaningful public input. All relevant comments were considered and addressed.

10. *The document lacks critical information necessary to understand the assessment process. Why has BLM suddenly stopped sending out draft assessments for the public? Stopped conducting real scoping? Is this really Scoping/Draft Assessment – or is it just a near-final EA to rubberstamp massive killing of woody vegetation and gross overstocking of the public lands?*

    BLM has followed its current scoping process. When one compares the scoping document and the EA, it is evident the scoping document is not a final EA, nor was it intended to be. Scoping comments that we received were seriously considered. Relevant comments were used by Interdisciplinary Team in developing a wider range of and additional alternatives. Please compare the alternatives outlined in the scoping document to those alternatives outlined in the EA to see the change between the documents and how the scoping comments were used to develop the EA.

<u>Idaho Fish and Game – August 31, 2009, Comments</u>:

11. *It appears that either action alternative will improve habitat conditions for fish and wildlife over current conditions. However, the EA does not provide an analysis of the differences to the affected environment as a result of the two action alternatives. The Department is not able to provide a thorough assessment of the potential impacts to fish and wildlife resources from the two action alternatives and, therefore, is not able to recommend one action alternative over the other.*

    The purpose of the scoping document is to inform interested and affected parties of the proposal and to solicit comments to assist with the NEPA review of the proposal. Analysis of the proposal is documented in the EA. Comments received in response to the scoping document were used to identify potential environmental issues related to the proposed action and to identify alternatives to the proposed action that meet the purpose of and need for the project. As such, BLM attempted to include enough information to provide for meaningful public input, but not to go into detailed analysis.

12. *The Pole Creek EA lacks basic information on potential juniper treatments, such as how stands will be determined for treatment, how many acres will potentially be treated, and stand prescriptions. It seems that juniper treatment is a stand-alone project separate from allotment renewal that should be reviewed under a separate analysis.*

    The intent of the scoping document was to solicit comments on what potential juniper treatments the interested and affected parties would want and why. A detailed description of the proposed juniper treatments is included in the Description of Alternatives section of the EA. Analysis of juniper treatment is included with permit renewal in this EA

because both affect whether Standards are met, interim livestock management is affected by broadcast burning, and combining analysis of activities is more efficient for the cumulative effects discussion.

13. *The current grazing management as well as all of the alternatives shows over 1,100 AUM's as suspended. However, no explanation is provided as to why these AUM's are suspended. Similarly, it is not clear if the AUM's in the allotment take into account the loss of forage from juniper encroachment or if the AUM estimate considers this.*

    As per 43 CFR 4100.0-5, "Suspension means the temporary withholding from active use, through a decision issued by the authorized officer or by agreement, of part or all of the permitted use in a grazing permit." A suspended AUM is use that has been allocated for livestock grazing in the past but is currently unavailable. As initial grazing allocations were determined in the 1930's, the DOI would issue a permit measuring grazing privileges in terms of "animal unit months" (AUMs), i.e., the right to obtain the forage needed to sustain one cow (or five sheep) for one month. In the event of range depletion, the Secretary maintained a separate authority, not to take areas of land out of grazing use altogether as above, but to reduce the amount of grazing allowed on that land, by suspending AUMs of grazing privileges "in whole or in part," and "for such time as necessary" 43 CFR § 4115.2_1(e)(5) (1964). The Department reduced individual permit AUM allocations under this last authority that by 1964 the regulations had introduced the notion of "active AUMs," i.e., the AUMs that a permit initially granted minus the AUMs that the department had "suspended" due to diminished range capacity, the total of both which is now called permitted AUMs. No documentation could be found that suggested any reason as to why 1,131 AUMs are in "suspended use" for the Pole Creek Allotment, but it is assumed that these reductions were due to lack of forage. AUMs outlined in Alternatives B, C1, and C2 take into account a significant amount of juniper expansion as shown in Appendix G, poor riparian conditions, not meeting any Standards in the most recent determination, and moderate-heavy livestock utilization that was documented in the early-mid 1990's.

14. *Monitoring of range conditions for adherence to the Idaho Standards for Rangeland Health is mentioned but no information is provided regarding the frequency of monitoring. The Department recommends that regular monitoring of rangeland conditions be included as an essential component of livestock management, particularly when the degraded condition of the Pole Creek Allotment is taken into consideration.*

    Monitoring is discussed in the EA in Section 2.2.1. In addition, Alternatives A1 and B would have additional monitoring as part of livestock management. See the response to Comment #7, above.

15. *The Department recommends the following guidelines be used when constructing new fences near sage grouse leks and other important habitat areas:*
    - *Avoid new fences within one kilometer of occupied leks;*
    - *Mark key sections of fence to reduce impacts;*

• Careful consideration should be given to important seasonal habitat areas, such as brood rearing areas, wintering areas, etc.

These guidelines are consistent with Boise District Office fence specifications and would be followed for new fence construction.

Western Watershed Projects – September 22, 2009, Comments:

16. *WWP requests that both of these documents be withdrawn and revised to allow for full public scoping. The documents as issued are not scoping documents, but rather full fledged Environmental Assessment equivalents with well-developed alternatives that prejudice the public's ability to affect the agency's consideration of reasonable alternatives through scoping in compliance with the National Environmental Policy Act (NEPA).*

    WWP's allegation that the scoping document is equivalent to a fully fledged EA with well-developed alternatives that prejudice the public's ability to affect the agency's consideration of reasonable alternatives through scoping in compliance with NEPA is an inaccurate statement. BLM has followed their current scoping process and there are no plans to withdraw the scoping document. In addition, BLM granted WWP's request for an additional week in which to provide further comments during the scoping process. Their comments and other interested public comments obtained during the scoping process were considered in the development of this EA. See the response to Comment #10, above.

17. *WWP is especially concerned that the BLM has already committed to one pre-determined outcome for livestock management on each of these allotments. The already completed surveying of fencing locations and stock tanks and pipelines on the Pole Creek allotment creates an incentive if not a conclusion that the management decision has already been made. This makes the need for reasonable alternatives all the more necessary in any NEPA compliant analysis including an acknowledgment and analysis of the impacts of the already completed surveying.*

    The surveying of potential pipelines and fences incorporated in some of the alternatives of the scoping document was necessary to determine their feasibility on the ground and to accurately analyze their effects. For instance the effects of a fence line that crosses a sensitive plant or cultural site would need to be adequately analyzed or moved to a different location. Additionally, the pipelines proposed in the scoping document have been removed and are no longer considered viable projects due to extensive on-the-ground analysis and survey.

    The process that the BLM has carried out in preparing the EA has been transparent, inclusive, and iterative. An examination of this process does not provide evidence to support the claim that BLM is committed to a pre-determined outcome. Alternatives presented in the EA were developed in response to scoping. Subsequent efforts by the ID

team have led to the refinement of alternatives and their ensuing analysis according to NEPA. The final decision will be based on this analysis.

18. *The BLM needs to include in all alternatives specific and annually measurable mandatory terms and conditions to address all of the failures to comply with the ISHR due to livestock mismanagement. The mandatory terms and conditions need to include minimum allowable stubble heights of vegetation in all riparian areas including mesic meadows and mesic floodplain areas; bank trampling standards, woody browse utilization standards and sage grouse nesting, brood rearing and wintering habitat needs.*

    In accordance with 43 CFR 4130.3 and 4130.3-2, the alternatives identified in the scoping document and subsequent EA contain terms and conditions that will help achieve the purpose and need, and will make progress towards meeting Rangeland Health Standards and Guidelines for Livestock Grazing Management. All alternatives contain mandatory terms and conditions that specify the kind and number of livestock, the period(s) of use, the allotment(s) to be used, and the amount of use (animal unit months) for every grazing permit or lease. The authorized officer may also specify in grazing permits or leases other terms and conditions which will assist in achieving management objectives, provide for proper range management or assist in the orderly administration of the public rangelands.

    In all grazing alternatives, stubble heights, bank trampling, woody browse utilization, etc. will be measured as management indicators for effectiveness monitoring to help determine whether animal numbers and dates (the terms and conditions) are resulting in the expected management effects (such as utilization). These management indicators articulate allotment-specific objectives, but they are not terms and conditions of the permit. This information will be used to inform future decisions. See Section 2.2.2 in the EA. In addition, Alternative A1 would include terms and conditions for mid-season monitoring (as spelled out in the stipulated agreement), and Alternative B would require annual indicator monitoring (under terms and conditions) for adaptive management.

19. *The BLM needs to include and analyze in all alternatives the establishment of livestock-free areas that can be used as reference areas in order to provide a benchmark for BLM management of livestock in similar unprotected areas on the allotments. For example, if a degraded stream is to be grazed by livestock under any alternative, the BLM should create an exclosure on that stream of at least half of its watershed that can be monitored to ensure that recovery of the grazed area comports to the recovery in the ungrazed area. The BLM needs to establish a measurable and annually quantifiable protocol to ensure meeting a fixed percentage of recovery in grazed areas as compared with ungrazed areas of similar character. WWP recommends that all alternatives have mandatory terms and conditions that all grazed areas that have been determined not to meet the ISHR and where livestock are the cause be recovered at an annual rate not less than 80% of the rate of recovery of areas that are ungrazed by livestock and used as a reference area.*

Although we have not stated that a reference area is proposed within the EA, several creeks would have very restricted livestock access under Alternatives B, C1, and C2, and could serve as de facto reference areas. Four very short gap fences (<50 ft.) are proposed to reduce livestock access down the Middle Fork Owyhee River, Scott Spring Creek, and Little Willow Creek. Additionally, much of Pole Creek is inaccessible due to a current gap fence that prevents livestock from trailing down the creek. Only two small water gaps would be present on the Middle Fork Owyhee River making approximately 0.25 miles of the 8+ miles of the river readily accessible to livestock. The remainder of the river is inaccessible or restricted and livestock access is highly unlikely due to steep rims that line the river.

As per the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management, "Rangelands should be meeting the Standards for Rangeland Health or making significant progress toward meeting the standards… 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." "Significant" is defined as measurable and observable, but not necessarily at 80% of the rate of recovery of reference areas.

Mandatory terms and conditions are discussed in Comment #18.

20. *In any alternatives in which the BLM is advocating resting certain area on either of these allotments the NEPA analysis needs to address the effect of higher concentrations of livestock in the areas that are still being made available to livestock grazing where the total authorized use is proposed to be the same as currently authorized (as currently proposed in these documents). Those impacts will affect whether significant progress is being made to meet the ISHR.*

    Effects of the stocking rate (and rest) for each resource are fully analyzed in detail within the EA for the appropriate use proposed in each pasture.

21. *The BLM must establish and analyze in all alternatives the specific annual, three-year, five-year and ten year monitoring that will be carried out to ensure that significant progress will be made each of those periods of time to meet or exceed the ISHR. The "scoping" documents as provided do not provide for monitoring of the impacts of livestock grazing on any schedule whatsoever.*

    Monitoring is discussed in the Section 2.2.1, and in Comment #7.

22. *All alternatives developed by the BLM for these two allotments need to analyze management of livestock so that the objective for all wildlife and aquatic habitats is excellent condition and not just good condition as described by the Zoellick and Cade Condition rating protocol of 2006.*

The objective is to improve habitat conditions over time, making measurable progress toward excellent habitat conditions. This is something that will take years to accomplish and measurable progress toward excellent habitat conditions would be the expected outcome of the selected alternative. However, there is no requirement that all alternatives analyzed must lead to the development of excellent wildlife habitat or aquatic conditions. There will be differences in alternatives, thus some alternatives are preferred over others.

23. *All alternatives need to provide and analyze the consequences that will occur if any terms and conditions of the grazing permit are not met. This is especially important for annual terms and conditions as well as three, five and ten-year mandatory terms and conditions of the permit.*

    Analyzing consequences that will occur if any terms and conditions are not met is not necessary. Our current grazing regulations (43 CFR 4100) provide for enforcement when prohibited acts or violations occur on the public lands. Specifically, 43 CFR 4140.1 clearly identifies the acts that are prohibited on public lands along with 43 CFR 4150.1 which explains unauthorized grazing use on public lands. The authorized officer shall determine whether a violation has occurred and violators are liable in damages to the United States.

24. *In all alternatives the BLM must assess the values to wildlife of keeping juniper dominant areas intact.*

    The value of juniper to wildlife is discussed in the document, as are the negative effects of juniper expansion into other habitat types. The treatment of juniper as proposed would leave 30 to 50% of existing seral juniper across the treatment area and provide for a diversity of habitat that would benefit wildlife more than the current condition. Joy Belsky (1996) of the Oregon Natural Desert Association stated that biodiversity most likely would be optimized by a landscape containing a mosaic of woodlands, grasslands, and intermediate seral communities. The values of not treating juniper are identified in the appropriate sections of the document but there is no requirement that they be repeated in each alternative.

25. *The BLM must provide in each alternative what the timeframe is for reaching all wildlife and aquatic habitat objectives. Currently the BLM has no timeframe developed for attaining these objectives.*

    Timeframes for achieving wildlife and aquatic habitat objectives will vary by alternative. Habitat objectives currently being met will be maintained. Objectives that aim at improving or enhancing habitat would be realized during the term of the permit. The various alternatives were designed to reach objectives at different paces, so some alternatives will reach objectives sooner than others. However, ultimately it is the intent of the prescribed management to accomplish and/or make significant progress toward achieving all objectives within the term of the permit.

A. Introduction for Proposed Action Alternative C1

This water quality restoration plan is for portions of the Middle Fork of the Owyhee River Sub-Basin (HUC 17050107) within the Pole Creek Allotment.

Streams in the Pole Creek Allotment include all or portions of: the Middle Fork Owyhee River and its tributaries (Scott Springs Creek, Granite Springs Creek, Two Springs Creek, and Little Willow Spring Creek), Pole Creek, and Squaw Creek and its tributaries (Scott Creek, Lunch Creek, Peach Creek, Helen Creek, Dutcher Creek, and Dukes Hole Creek).

The Middle Fork Owyhee River and Pole Creek drain the western slope of Juniper Mountain in the Owyhee Mountain range and flow generally west from Idaho into Oregon. Squaw Creek also drains the west slopes of Juniper Mountain and is a tributary to the North Fork Owyhee River. Streams in the Pole Creek grazing allotment, are used primarily for livestock grazing and fish and wildlife habitat.

Streams with designated beneficial uses are addressed under the Idaho Administrative Procedures Act (IDAPA) 16.01.02.140. All streams within the Pole Creek Allotment have a general use designation for secondary contact recreation, agricultural water supply, wildlife habitat, and aesthetics. The Middle Fork Owyhee River has been assigned additional designated uses including domestic water supply, cold water biota, salmonid spawning, primary contact recreation, and special resource water. Squaw Creek also has additional beneficial uses of cold water biota and salmonid spawning. Idaho DEQ identified that the Middle Fork Owyhee River was not supporting cold aquatic life and salmonid spawning beneficial uses, and that Squaw Creek and 1.5 mile reach of Pole Creek are meeting their beneficial uses.

The 2010 Integrated Report by Idaho Department of Environmental Quality (IDEQ) lists impaired waters and the current status of state waters. The Middle Fork Owyhee River was classified by the Environmental Protection Agency (EPA) under 303(d) of the Clean Water Act as water quality limited due to high water temperatures and flow alterations.

Total maximum daily loads (TMDLs) were developed for stream temperatures in the Middle Fork Owyhee River. EPA does not require flow alteration to be addressed as a TMDL pollutant; therefore flow alteration is not addressed.

The 2009 North and Middle Fork Owyhee TMDL Five-Year Review conducted by IDEQ identified that “temperature targets (based on Idaho’s Water Quality Standards) were found to be unattainable. This was one of the first temperature TMDLs developed in Idaho and very little guidance existed at the time. It was recommended that the temperature TMDL be re-written using the new ‘potential natural vegetation’ approach”. The potential natural vegetation method uses stream shading as a surrogate for temperature, and the TMDL target would be the level of shading expected in a reference stream with similar vegetative potential. Until instituted, the numeric water temperatures would apply.

All water bodies are required to meet Idaho water quality standards for designated beneficial uses within the State of Idaho. According to Section 401 of the Clean Water Act, in the case of interstate waters where State criteria differ, the more restrictive standard must be met at the border. Oregon's integrated 303(d) report (2010) identifies the pollutants for the Middle Fork Owyhee River as: flow and habitat modification, neither require TMDLs.

B. Recovery Goals and Objectives

Recovery goals include compliance with the Clean Water Act and Idaho Water Quality Standards for temperature, sediment, and bacteria on streams crossing public lands in the Pole Creek Allotment.

Objectives include: improve herbaceous and woody species diversity, composition, density, vigor, cover, structure and root-mass; reduce streambank damage; reduce bacterial contamination of the streams.

The vegetation community required to meet the standard for temperature is expected to be:

- Woody species density and canopy cover providing 80 percent or more stream shading.

- A preponderance of late seral stage hydric herbaceous species such as Nebraska sedge and beaked sedge.

C. Restoration Plan

The following Best Management Practices, to address pollutant sources, are in compliance with the Natural Resources Conservation Service, Conservation Practice Standards for Prescribed Grazing, Code 528A:

- Utilization of key upland herbaceous forage species by livestock of no more than 50% if pasture includes rest or deferred rotation.
- Utilization of key upland herbaceous forage species by livestock of no more than 40% if pasture is grazed during the critical growth period (when perennial grasses are actively growing) every year.
- Salt and supplement will not be placed within one quarter mile of riparian areas, springs, streams, meadows, aspen stands, playas, or water developments.
- Streambank alteration by hoof impacts less than 10% in linear area.
- Herbaceous riparian residual stubble height of at least 4" (where applicable) at the end of the growing season.
- Utilization of riparian willows less than 25% on shrubs under five feet in height.
- State Line Fence – Approximately 2.1 miles of Oregon State Lands and Owyhee Field Office BLM lands would be fenced/gap fenced on the Oregon/Idaho state line to prevent livestock access between states. This would be a 4-wire, smooth bottom wire fence. Much of the fence in the Pole Creek Breaks area would be gap fences on ridge tops above steep, impassable drainages/canyons.
- Horse Flat Pasture Division Fence – Approximately 1 mile of new 3-wire (smooth bottom) fence would be constructed and tied into the Pole Creek Fence, a cliff above CCC Spring, and the Middle Fork of the Owyhee River, creating a new pasture. A cattleguard would be placed where the fence crosses the road.

- CCC Spring Exclosure – An exclosure around CCC Spring would be constructed to protect the cultural sites and riparian areas.
- Middle Fork Owyhee River Exclosure – Approximately 0.5 miles of new 3-wire (smooth bottom) fence would be constructed on the north side of the Middle Fork Owyhee River to provide an exclosure. Currently, the site is a large water gap area for livestock watering.
- Little Willow Spring Exclosure Expansion – The exclosure around Little Willow Spring would be expanded to include the entire wetland area. The pipeline and trough may also be moved away from the spring approximately 100 ft.
- Big Willow Spring Exclosure Expansion – Big Willow Spring Exclosure would be expanded to protect the upper end of the riparian area.
- Scott Spring Creek Gap Fence – Approximately 50 ft. of new 3-wire (smooth bottom) fence would be constructed in the canyon below Scott Spring to restrict livestock down the creek.
- Middle Fork Owyhee River Gap Fences (2) – Approximately 50 ft. each of new 3-wire (smooth bottom) fence would be constructed in the Middle Fork Owyhee River canyon. One gap fence would be located at the Idaho/Oregon boundary and the other would be upriver approximately 2.5 miles to restrict livestock down the river.
- Little Willow Springs Gap Fence – Approximately 50 ft. of new 3-wire (smooth bottom) fence would be constructed in the canyon below Little Willow Spring to prevent livestock from trailing down the steep canyon.

D. Margin of Safety

Rest-rotation spring grazing system would improve riparian vegetation conditions because livestock would tend to spend more time in the uplands due to similar or better forage quality. Consequently, less livestock in the riparian areas should equate lower riparian vegetation utilization and less streambank alterations. Livestock would be removed from the allotment by June 30th, giving three possibly four months of riparian vegetation recovery. Additionally, Pole Creek Breaks, Berry Gulch, and Horse Flat pastures would be rested for a total of five years and Scott Spring Pasture would be rested for six years in a ten year grazing permit. Riparian vegetation growth and development should improve in the rest years and would alleviate damages incurred during grazing.

In the long term, the early-seral dominated riparian vegetation communities would eventually change to communities dominated by late-seral, deep-rooted species. Stream channels would improve as they narrow and deepen, and streambanks would stabilize due to deep-rooted riparian vegetation. Improved vegetative conditions would result in improved buffering of erosive forces of high flows and increased filtering of sediment allowing for bank stabilization and aggradation, and increased amounts of shade. Streambank stability would improve, water infiltration and bank storage would increase, and water quality and fishery habitat would improve over the long term.

The proposed range improvement projects would directly and indirectly improve riparian vegetation conditions. Expanding spring exclosures on Little Willow and Big Willow springs, along with creating exclosures on CCC Springs and Middle Fork Owyhee River would protect the integrity of the current riparian vegetation community while allowing that community to expand and grow. Gap fences on Little Willow Spring drainage and Scott Spring Creek and Middle Fork Owyhee River would restrict livestock access thru these drainages and ultimately to the Middle Fork Owyhee River. Lotic conditions would be expected to improve immediately, unhindered from livestock grazing. Pasture division fences would improve livestock

management and distribution by limiting where the livestock can travel to and prevent unauthorized use from outside the allotment.

E. Implementation Plan

The grazing system is targeted to be implemented in the year 2012. The target date for fence construction and exclosure construction also targeted for 2014.

Established Multiple Indicator Monitoring (MIM) sites on Middle Fork Owyhee River (2 sites), Squaw Creek, and Pole Creek would continue to be monitored every 3 to 5 years. In addition, MIM sites on Squaw Creek (near the confluence with Peach Creek) and one on Peach Creek would be established and monitored periodically.

F. Estimated Recovery Time

Responses to the management changes would be observed in as little as 5 years on some stream segments. Full recovery would be expected in 20 to 25 years on most streams that are functional-at risk. Middle Fork Owyhee River would be expected to meet IDEQ water quality standards by 10 years of project and management implementation. Those streams that are non-functioning would be expected to take 30 years or more for full recovery.

Time frames for stream recovery in this area are based on observations of recovery times in nearby exclosures and allotments with similar grazing management changes by Riparian /Water Quality Specialist with the Owyhee Field Office BLM.

G. Cumulative impacts of past, present, and future management

It is expected that all streams in the Pole Creek Allotment would recover from past and present management under the proposed grazing management system. The Pole Creek Allotment comprises 33 percent of the Middle Fork Owyhee River hydrologic unit (HUC# 1705010708), and 90 percent of the Pole Creek hydrological unit (#1705010707). The portion of the allotment that is within the Squaw Creek watershed comprises 7 percent of the North Fork Owyhee River hydrological unit (#1705010706).

The proposed improved management on the Pole Creek Allotment would have the greatest effect on streams located entirely within the allotment; however it would also have positive impacts on water quality of downstream segments of streams associated with the allotment.

The headwaters of many streams are located within this allotment. The establishment of deep-rooted species such as sedge, rush and willow would help these stream headwaters to deepen and narrow and also increase stream shading, which would provide cooler water with less sediment and bacteria to downstream reaches. This, in conjunction with the development of upstream seed sources, would help the lower reaches to recover more rapidly when new grazing systems are implemented there.

H. Monitoring Plan

Permanent MIM sites are located on Middle Fork Owyhee River (2 sites), Squaw Creek, and Pole Creek as well as establishing additional MIM sites on Squaw Creek and one on Peach Creek.

These sites would be monitored in 3-5 year intervals and data would include herbaceous stubble height, woody browse, stream bank stability, and many more fluvial and riparian measurements.

Water chemical parameters such as stream temperatures and bacteria counts would be monitored in 3-5 year intervals, or as deemed necessary to gather background data and to determine compliance with Idaho Water Quality Standards in the Middle Fork Owyhee River, Pole Creek, and Squaw Creek.

Functioning Condition assessments (PFCs) on Middle Fork Owyhee River, Pole Creek, and Squaw Creek would be conducted in 10 year intervals or when a change in functioning condition is apparent, whichever occurs first.

All monitoring is subject to future funding and available personnel.

Appendix E. Boise District Range Readiness Worksheet

Boise District Spring Range Readiness Worksheet

Date:_____ Allotment: _____

Owyhee Field Office Pasture: _____

Recorded by: _____ UTM/Legal: _____

Plant Species	Range Readiness Criteria	Recorded Condition
BRTE (cheatgrass) (with few perennials)	3rd leaf stage and 2" green active growth	
BRTE (cheatgrass) (with substantial perennial grass component)	3rd leaf stage and 2" green active growth with old growth, or 4" without old growth	
TAAS (medusahead)	Soil must be firm, and 3rd leaf stage with at least 2" green active growth	
POSA3 (Sandberg bluegrass)	Greater than 1" active growth and seed stalks forming	
Wheatgrass seedings	Average 4" active growth with old growth present, or 6" active growth without old growth	
SIHY (squirreltail)	Average 3-4" active growth with old growth present or 5" active growth without old growth	
AGSP (bluebunch)	4" active growth with old growth present or 6" active growth without old growth	
FEID (Idaho fescue	3-4" active growth with old growth present or 5" active growth without old growth	
Soils	No evidence of puddles or frost, soil firm. Sufficient soil moisture exists to allow adequate regrowth on spring/fall range.	

NOTES: _____

_____

_____

Appendix F. Plant species names for common names used in the Pole Creek EA

Common Name	**Scientific Name**
aspen	*Populus tremuloides*
Bacigalupi's downingia	*Downingia bacigalupii*
bitter cherry	*Prunus emarginata*
bitterbrush	*Purshia tridentata*
bluebunch wheatgrass	*Pseudoroegneria spicata*
bulbous bluegrass	*Poa bulbosa*
Canada thistle	*Cirsium arvense*
ceanothus	*Ceanothus velutinus*
cheatgrass	*Bromus tectorum*
chokecherry	*Prunus virginiana*
crested wheatgrass	*Agropyron cristatum*
curl-leaf mountain mahogany	*Cercocarpus ledifolius*
currant	*Ribes spp.*
dimeresia	*Dimeresia howellii*
harlequin calicoflower	*Downingia insignis*
Idaho fescue	*Festuca idahoensis*
intermediate wheatgrass	*Thinopyrum intermedium*
Japanese/field brome	*Bromus arvensis*
leafy spurge	*Euphorbia esula*
low sagebrush	*Artemisia arbuscula*
meadow foxtail	*Alopecurus pratensis*
medusahead	*Taeniatherum caput-medusae*
mountain big sagebrush	*Artemisia tridentata ssp. vaseyana*
needlegrass	*Achnatherum spp.*
Oregon grape	*Mahonia repens*
prickly lettuce	*Lactuca serriola*
rabbitbrush	*Chrysothamnus & Ericameria spp.*
Russian knapweed	*Acroptilon repens*
Sandberg bluegrass	*Poa secunda*
serviceberry	*Amelanchier alnifolia*
smooth brome	*Bromus inermis*
snowberry	*Symphoricarpos oreophilus*
squirreltail	*Elymus elymoides*
thinleaf goldenhead	*Pyrrocoma linearis*
western juniper	*Juniperus occidentalis*
whitetop	*Cardaria draba*
wild rose	*Rosa woodsii*
willow	*Salix spp.*
ventenata	*Ventenata dubia*

Nomenclature reference: USDA, NRCS PLANTS database as of July 2010

Appendix G. Photo documentation of juniper expansion in the Juniper Mountain Area from 1963 to present. 1963 and 1981 photos from Furniss 1985. 2009 photos by BLM.

Photo sequences are from three different locations.

Sequence 1 – Facing East along Bedstead Ridge Rd.

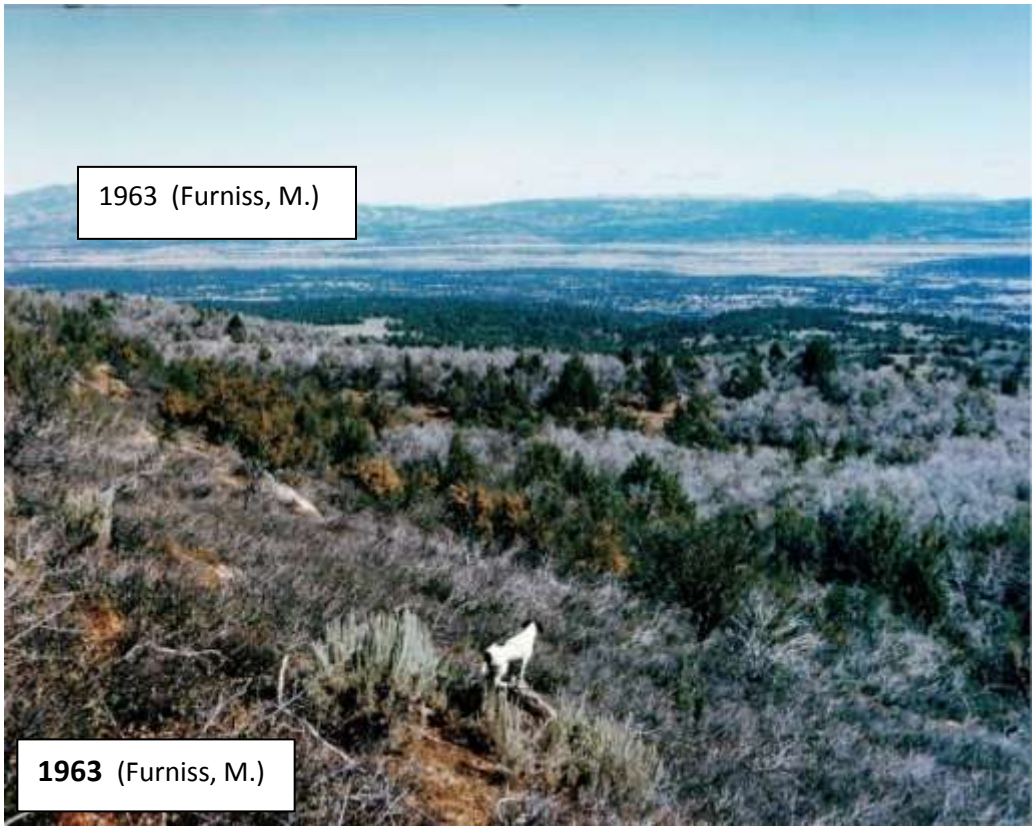
UTM NAD 83: 4700553N, 510727E

1981 (Furniss, M.)

2009 (BLM)

Sequence 2 – Facing Northeast along Bedstead Ridge Rd.

UTM NAD 83: 4701585N 510245E

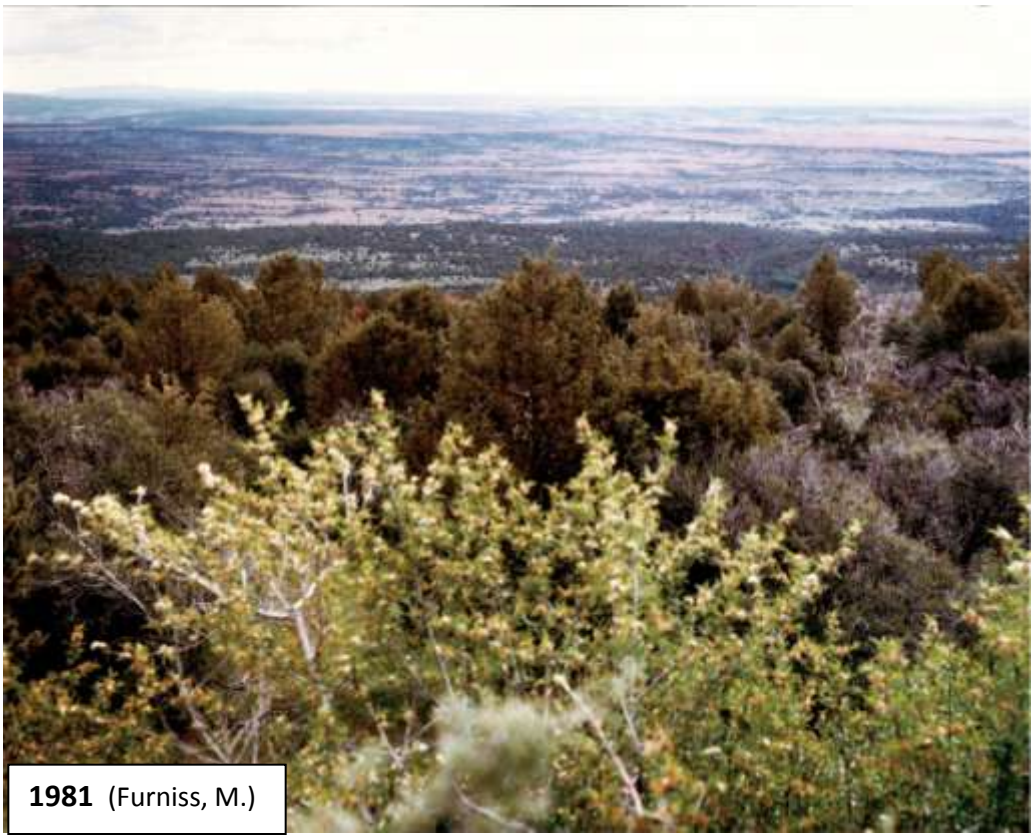


1981 (Furniss, M.)

2009 (BLM)

Sequence 3 – Facing East along Bedstead Ridge Rd.

UTM NAD 83: 4700283N 510775E



1981 (Furniss, M.)

2009 (BLM)

Pole Creek Allotment – Appendix H
Trend Data – Summary, Analysis, and Discussion
Beth Corbin
2/22/2011

Monitoring Sites:
Eight trend monitoring sites have been established within the Pole Creek Allotment. The five longest-established sites are in the largest pastures (#1A Pole Creek Breaks and #1B Horse Flat). In 2009, one new monitoring site was established in each of the Dutcher (#2) and Berry Gulch (#3) Pastures, plus one additional in the Scott Springs Pasture (currently part of the Horse Flat Pasture). (See Figure 1 – Map of Monitoring Site Locations.) Three of the monitoring sites are mapped within a loamy 13-16" mountain big sagebrush/bluebunch wheatgrass-Idaho fescue ecological site, while another three are mapped within the very shallow stony loam 10-14" low sagebrush/Sandberg bluegrass-bluebunch wheatgrass ecological site and two within the shallow claypan 12-16" low sagebrush/Idaho fescue ecological site. However, all sites are dominated by low sagebrush, indicating shallow soil. Therefore, apparently all of the monitoring sites are within the very shallow stony loam or the shallow claypan ecological sites. The lack of monitoring sites in the loamy big sagebrush ecological site may reflect the fact that much of loamy big sagebrush has been heavily encroached by juniper.

Because long-term trend sites do not span all pastures or all ecological sites within the pastures, one needs to be very careful in attempting to apply data from these sites to elsewhere in the Pole Creek Allotment.

Frequency:
Trend data for the five older monitoring sites within the Pole Creek Allotment were summarized and analyzed. Each of these five monitoring sites has data collected for four different years over a 13-year period (1997, 2000, 2005, and 2009)[1]. A non-statistical display shows the frequency of selected plants at each site, grouped into graphs for grasses, shrubs and trees, and forbs; frequency for each species is graphed on the Y axis, with year on the X axis. This gives an overall visual of apparent trend and an implication of relative abundance, which may be useful for qualitative assessment, but is not statistically meaningful. See the attached set of graphs (Figure Set 2).

To compare frequency between years at individual sites, four representative species were selected: Idaho fescue, Sandberg bluegrass, low sagebrush, and phlox (longleaf or Hood's), to represent the following structural groups: deep-rooted bunchgrasses, small bunchgrasses, shrubs, and forbs, respectively. These species were generally the most abundant in each group, providing enough data for meaningful analysis. 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. 1997 to 2000,

[1] Data were also collected in 1988 at some sites, but because they are not included in the OFO Access database, and because data from that far back are less relevant to the current decision, they were not included in this analysis.

2000 to 2005, and 2005 to 2009) was significantly different at p=0.1. The attached table shows the result of that comparison (Table Set 3).

A note on statistical methods:
In the past, apparently, Chi Square analysis was used to compare means between years. This statistic 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.

Results:
For Idaho fescue, three of the five sites sampled showed a significant reduction in frequency between 2005 and 2009. Between 2000 and 2005, one site showed a significant reduction in frequency, while two sites showed a significant increase in frequency. Between 1997 and 2000, one site showed a significant increase in frequency. All other sites showed insignificant changes between adjacent sampling years. There was no clear pattern in which sites showed increases or decreases between years. (i.e. two sites had one year of reduction, one site had one year of increase, and two sites had one year of reduction and one year of increase, for the three comparisons.)

Sandberg bluegrass results showed less change. Between 2005 and 2009, one site showed a significant increase in frequency. Between 2000 and 2005, one site increased and one site decreased frequency significantly. Between 1997 and 2000, one site showed a significant increase. But 11 out of 15 comparisons showed no significant change in frequency.

Low sagebrush frequency was similar, with two of five sites showing significant increases between 2005 and 2009. Between 2000 and 2005, one site increased, while one site decreased frequency significantly. One site decreased significantly in frequency between 1997 and 2000.

Phlox patterns also showed little change. Between 2005 and 2009, one site showed significant increase, while one site showed significant decrease. No significant change between 2000 and 2005 in phlox frequency was apparent. Between 1997 and 2000, two sites showed significant reductions in phlox frequency.

In addition to the analysis summarized above on representative species, frequency data can be summed by structural groups, such as deep-rooted grasses, shallow-rooted grasses, or perennial forbs. Because annuals were not consistently recorded until recently (since 2005), and because identification is often more difficult for annuals, there are not enough reliable data for annuals to

analyze frequency. Total frequency for each of the other structural groups is displayed, but statistical analysis was not attempted. Visual impressions reveal high variation in perennial forb frequency, probably related at least in part to difference in observers. Deep-rooted grasses appear to consistently decline since 2005, moderate-rooted grasses appear mostly stable, and shallow-rooted grasses are variable. Again, no statistics were run to estimate significance. See Table/Figure Set 4.

The nested frequency data can also be used to infer species richness and changes in invasive weed frequency. Herbaceous perennial species (grasses and forbs, including non-natives) richness is shown in Table/Figure Set 5. The number of species observed at all sites appeared to increase in 2009; however, it is unclear whether this reflects an actual trend, simply a favorable year for herbaceous perennials, or differences in observers between years.

Trends in invasive weed frequency are even more difficult to determine, since few have been recorded. See Table 6. Most weeds are recorded only sporadically. Because annuals were not recorded before 2005, no comparison with earlier years is possible. Annual bromes recorded variously as *Bromus briziformis*, *Bromus japonicus*, and *Bromus* sp. are probably all the same species (most likely *Bromus arvensis*, the current name for *Bromus japonicus*), but it's questionable whether the apparent increase between 2005 and 2009 is real or based on differences in observers or other factors. Likewise, bur buttercup is recorded first in 2009, with high frequency at two sites. Was it truly absent in 2005 and really that abundant in 2009? I suspect that what was recorded as bur buttercup in 2009 was actually the native annual *Navarretia*. Is the record for tumble mustard (one site for one year) real, or a recording error (SISYM, *Sisymbrium*, recorded instead of SISYR, *Sisyrhinchium*, a native recorded in other years at that site)? Information on trends in bulbous bluegrass frequency would be especially helpful, but those data are not available (see Data Issues discussion below). In summary, although nested frequency data could be very useful for weed trends, in practice that is not the case for this allotment.

Interpretation:
None of the data shows a clear trend in frequency for any of these species or sites. Idaho fescue, representing deep-rooted (large) bunchgrasses, appears to show a decline in the most recent sampling, between 2005 and 2009, as indicated by significant reductions at three of five sites. Because Idaho fescue's changes between 2000 and 2005 are more ambiguous (two sites increasing, one decreasing), longer term trends are not obvious. Grazing management changed somewhat in 2008, with court-ordered removal of cattle from the allotment when riparian stubble height criteria were exceeded; this occurred approximately mid-season for each pasture. Thus, actual use (total AUMs) in 2008-2010 was less than most previous years. This reduction in use has apparently not (yet) had an effect on deep-rooted bunchgrass frequency, perhaps because the 2009 trend reading reflects only the 2008 use. In any case, the data do not suggest upward trend in large bunchgrasses, but at best stable or variable. This may be a function of the season of use, which has generally been July through September (earlier removal since 2008). Although much of its early critical growing season has passed by then, Idaho fescue is likely to be still growing and flowering into July, particularly at higher elevation sites, so grazing at the earlier part of this grazing period may be preventing Idaho fescue from increasing in frequency.

Notice that bluebunch wheatgrass was rarely encountered in four of the five sites. At the one site it occurred frequently enough to analyze, bluebunch showed a significant decline between 2000 and 2005, and no significant change between 2005 and 2009. This indicates that this species, which is expected to be a dominant or co-dominant grass under reference conditions for these sites, is highly lacking and apparently not increasing.

Sandberg bluegrass, representing small bunchgrasses, is mostly stable, with perhaps a slight upward trend (at least at one of the five sites). This is logical, given past management, because Sandberg bluegrass flowers and matures earlier in the year than Idaho fescue and other bunchgrasses, so it has presumably largely been through its critical growing period by the July to September season of use. See the discussion below on Sandberg versus bulbous bluegrass issues.

Low sagebrush trends are mostly stable, or somewhat increasing in frequency at one site. This indicates that this important structural component of the plant community is showing little change, so sagebrush is not generally increasing and replacing herbaceous vegetation, nor is it being lost to juniper encroachment at these particular sites.

Perennial forb frequency, as represented by phlox species, showed no clear trends, in either the most recent sampling or cumulatively. This indicates stable or variable conditions for this group of plants.

Trend cannot be determined from one reading at the three sites established in 2009. However, one year's data may be useful for showing relative abundance among species and species groups.

- The Scott Spring Pasture site shows moderate frequency for bluebunch wheatgrass (32% frequency in 50x50cm plots), squirreltail (32%), and Idaho fescue (24%), with a higher frequency of Sandberg bluegrass (41%) and bulbous bluegrass (53%), and low cheatgrass frequency (3%). Native perennial herbs show moderate species richness (8 species) with low to moderate frequency (1-32%). The most frequent annual herb was the native willowherb, with 45% frequency. Low sagebrush and juniper appeared in plots infrequently (5% and 4% respectively).
- The Dutcher Pasture site shows high frequency of Sandberg bluegrass (95%), bulbous bluegrass (62%), Japanese/field brome (52%), and cheatgrass (30%) – shallow-rooted perennials and non-native annuals, with little bluebunch wheatgrass (7% frequency). Forbs are dominated by annuals, mostly native (willowherb 82% frequency), with moderately low native perennial frequency, and moderate diversity (I species). Low sagebrush was recorded in 17% of the plots.
- Data from the Berry Gulch Pasture site is problematic, because photos show a nice stand of Idaho fescue, but the frequency data record only Sandberg bluegrass (96%) and no Idaho fescue. Bluebunch wheatgrass (18% frequency) and squirreltail (3%) are also recorded. No bulbous bluegrass was recorded at this site, and only 1% frequency of cheatgrass. Forbs are dominated by native perennials (11 species with 1-53% frequency), with few annuals. Low sagebrush was recorded in 62% of plots, and only 2% western juniper frequency. Assuming most or all of the bluegrass records are actually Idaho fescue, this site appears to be a very nice low sagebrush and bunchgrass community.

Data Issues:
Some caution must be used in viewing parts of these nested frequency data, particularly in regard to species identification. The 2009 data from Berry Gulch (as mentioned earlier) is one example. At all sites, the most questionable aspect relates to Sandberg bluegrass versus bulbous bluegrass. Sandberg bluegrass is a native perennial that makes up a strong component of the reference plant community, particularly in the very shallow stony loam ecological sites. Bulbous bluegrass is a non-native perennial, introduced probably in seed mixtures years ago, which has widely spread and, at least in some places, replaced desirable natives. It reproduces vegetatively by bulblets rather than producing seed. However, without flowering stems, they are not always easy to tell apart without digging up the base of the plants; also, it appears that in earlier years in the Boise District, they intentionally combined Sandberg and bulbous bluegrass frequency and recorded it as Sandberg bluegrass (Kathi Kershaw, pers com). Therefore, the frequency records for Sandberg bluegrass probably reflect a combination of Sandberg and bulbous bluegrasses, and trends for each of these species individually cannot be determined.

Likewise, there appears to be some confusion about the species of phlox in some years, with perhaps inconsistent recording of *Phlox longifolia, Phlox hoodii,* and *Phlox* sp. These can probably be more easily sorted out, and because all are native perennial forbs, the inconsistency does not make the data less meaningful.

One other data issue may be the identification of needlegrass species. *Stipa thurberiana* (now *Achnatherum thurberianum*) was occasionally recorded. It's possible that plants of needlegrass species (several of which occur on Juniper Mountain) were recorded as Idaho fescue. Since both needlegrasses and Idaho fescue are deep-rooted native perennial bunchgrasses, this combination (if it occurred), has likely had little effect on the interpretation of the data.

Similarly, the weedy annual bromes variously recorded as *Bromus briziformis, B. japonicus,* and *Bromus* sp. are likely all the same, so treating them as a group is appropriate.

Shrub and Tree Density:
Shrub and tree densities were counted in two 0.01-acre plots at each monitoring site. Data are shown in Table/Figure Set 7. No statistical tests were run on these data, since only two samples per site were taken, so interpretations are only visual. Density should logically show similar trends to frequency for the woody species measured, but the difference in plot sizes between the two methods may influence the results. 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.

Low sagebrush density appears to be steadily declining since 1997 at four of the five monitoring sites, while one site showed an apparent decline from 1997 to 2005, but then an increase in density between 2005 and 2009. Again, these results are not necessarily statistically significant. Compare this to the frequency data for low sagebrush, where three sites showed no change and two showed an increase in frequency between 2005 and 2009. Interestingly, the site that showed an increase in density was not one of the two sites that showed an increase in frequency for the

last sampling interval. Taken together, this all suggests that apparent trends in low sagebrush should be considered somewhat skeptically, and no trend is consistently obvious.

Ground Cover

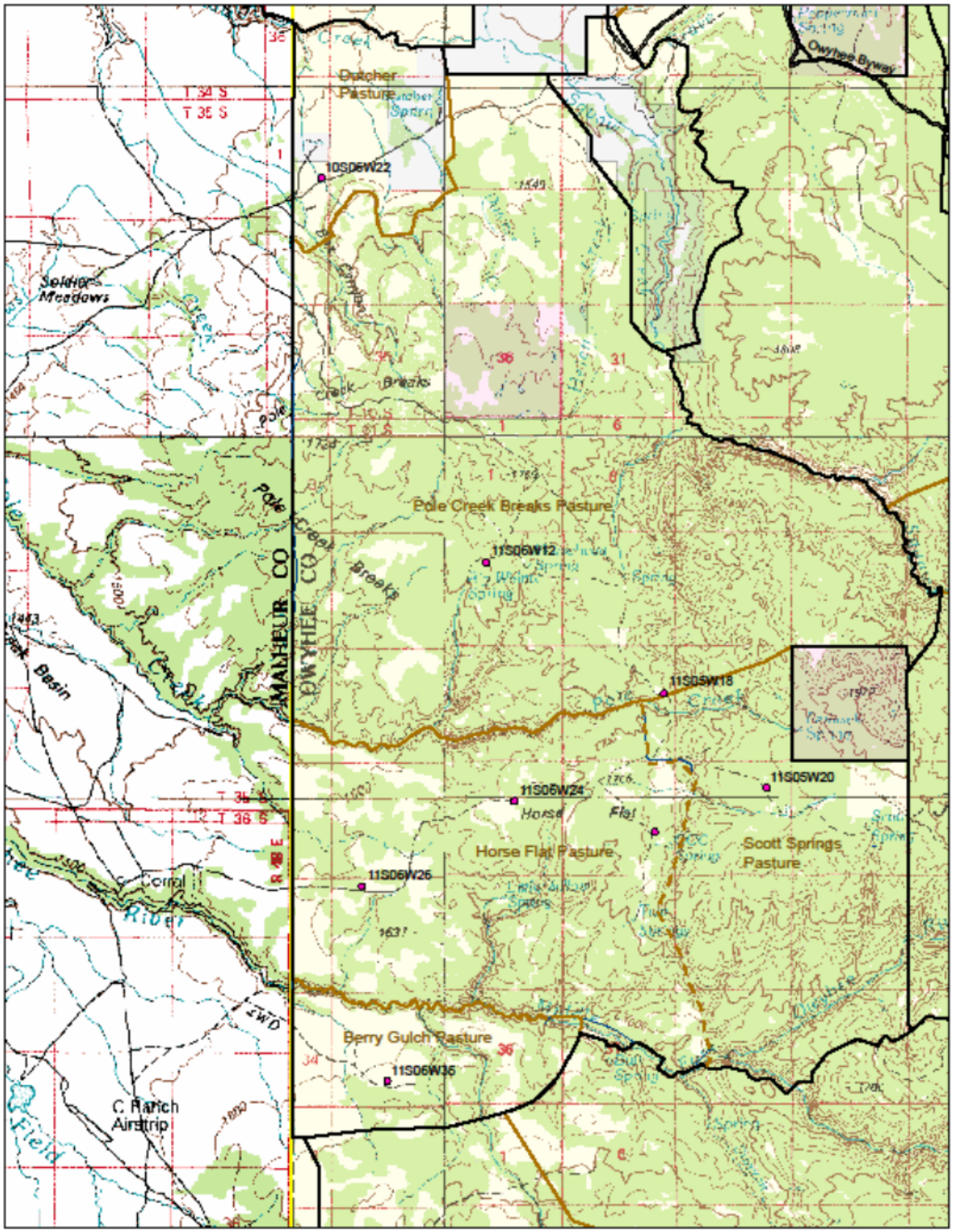
Ground cover was compared between 2000 and 2009 at the five revisited trend sites. Ground cover is recorded as a point intercept for 80 points at each of the five belts, resulting in 400 hits per site. Paired, two-tailed Student's T tests were calculated on the mean percentages of each belt. Figure 8 displays the data. At all five sites, the percentage of basal vegetation showed a significant (at $p<0.1$) reduction, although canopy cover showed a significant increase at three of the five sites (with no significant change at the other two sites). This may suggest that perennial grasses and forbs (which normally contribute most to basal vegetation in these plant communities) are decreasing, while woody plants (juniper and sagebrush, which make up the canopy layer) are increasing on at least some sites. This agrees with the general trend shown in the nested frequency data, although the nested frequency data were not as clear.

The percentage of bare ground was statistically unchanged (at $p<0.1$) for four out of five of the sites, while one site showed a significant decrease in bare ground. The more stable ground cover elements (rock, gravel, persistent litter, and biological soil crusts, combined) showed a significant decrease at three of five sites (no change at the other two sites), while non-persistent litter (which includes annual vegetation) showed a significant increase at all five sites. This may suggest a shift from more stable to less stable cover, which would be less desirable for erosion protection from a watershed perspective. It may also suggest an increase in annuals (such as cheatgrass), although the frequency data show very low frequency of annual grasses at most sites. However, perhaps more important is the bare ground parameter, which is unchanged (or improved at one site). This implies that the increase in non-persistent litter may well be covering stable ground cover, so the net effect on the watershed is neutral (to positive). It is also possible that methodology was not consistent between 2000 and 2009, particularly in regard to how persistent and non-persistent litter were defined. Comparing the bare ground factor (which is unlikely to be recorded as something else), may be more meaningful.

In summary, ground cover data do not show an improvement in herbaceous vegetative cover. Soil cover parameters are more ambiguous, but from a watershed perspective are probably more or less stable between 2000 and 2009.

Figures and Tables:

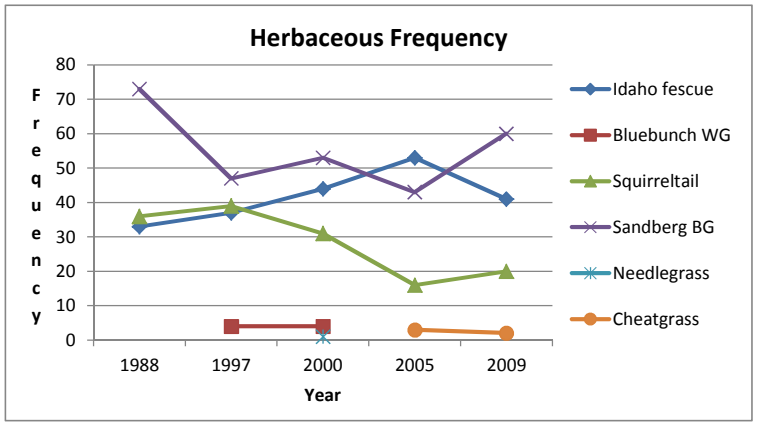
- Figure 1 – Monitoring Site Locations Map
- Figure Set 2 – Frequency Graphs
- Table Set 3 – Statistical Comparison of Difference between Frequency Means for Representative Species
- Table/Figure Set 4 – Frequency of Structural Groups
- Table/Figure Set 5 – Herbaceous Species Richness
- Table 6 – Non-native Weeds
- Table/Figure Set 7 – Shrub and Tree Density
- Figure 8 – Ground Cover

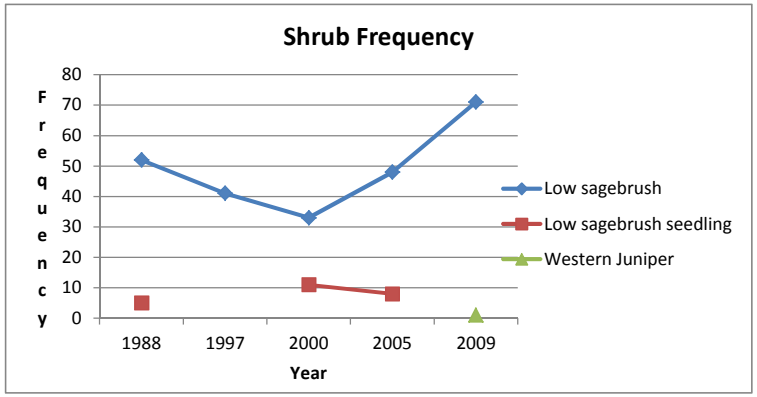


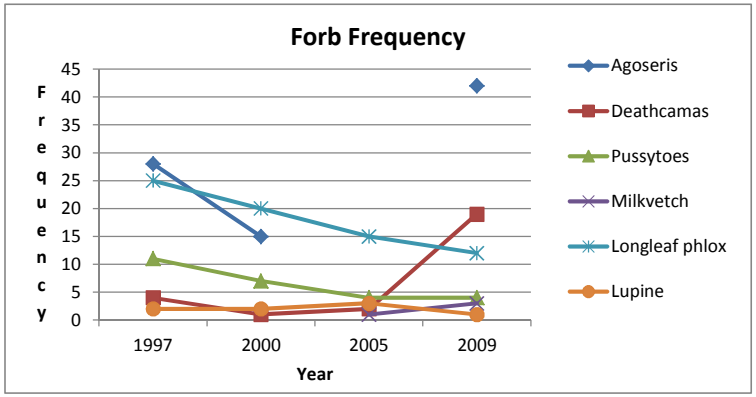
Pole Creek Allotment - Trend Monitoring Sites

BLC 2/9/11

11S05W19







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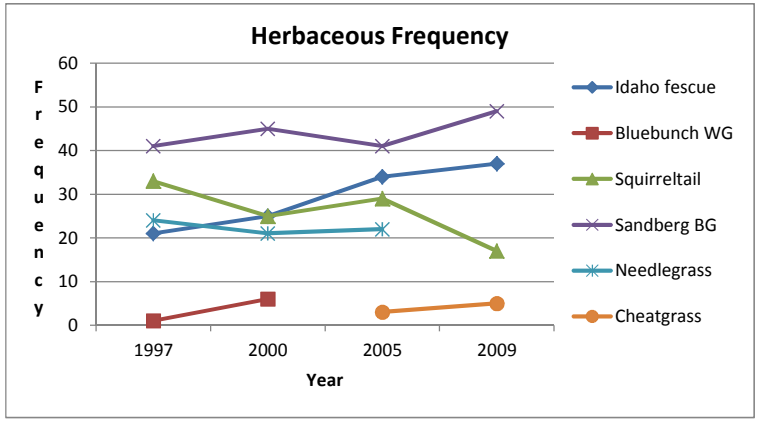

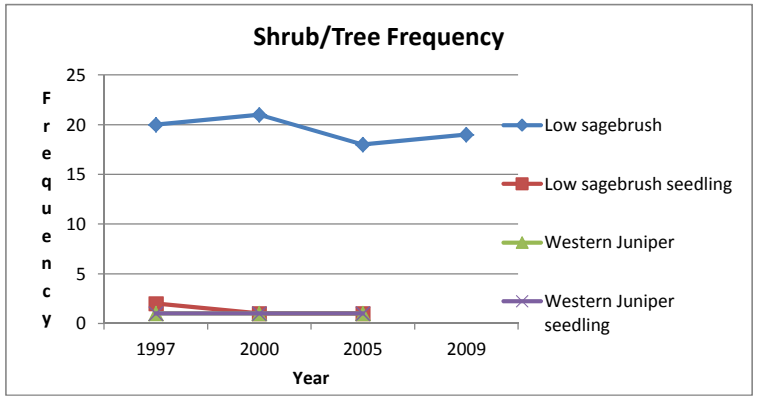

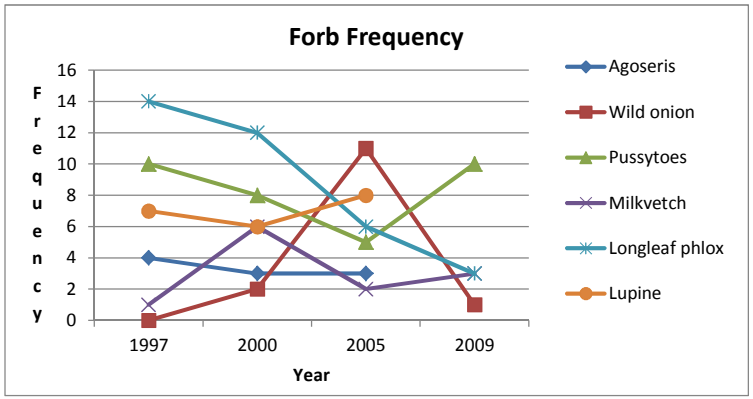

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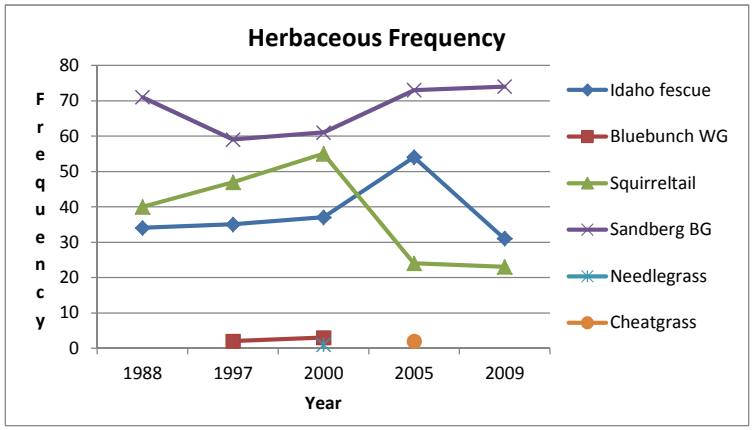

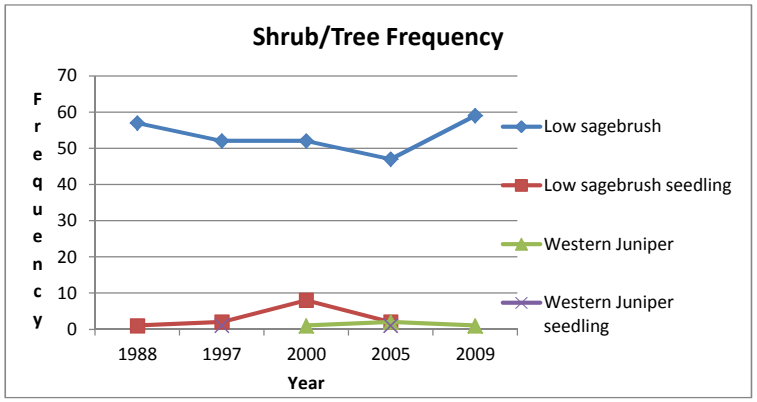

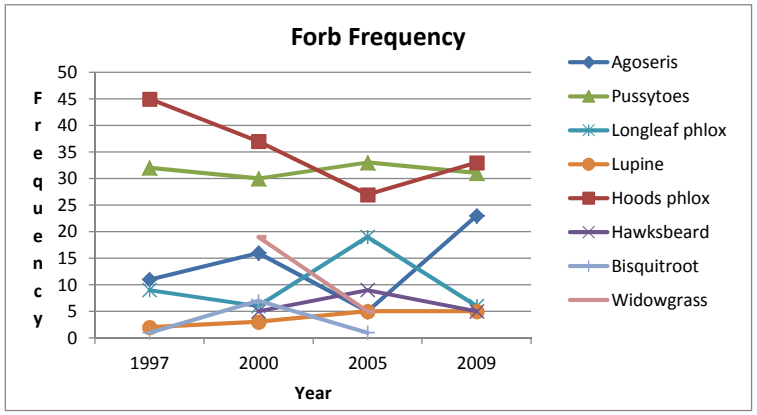

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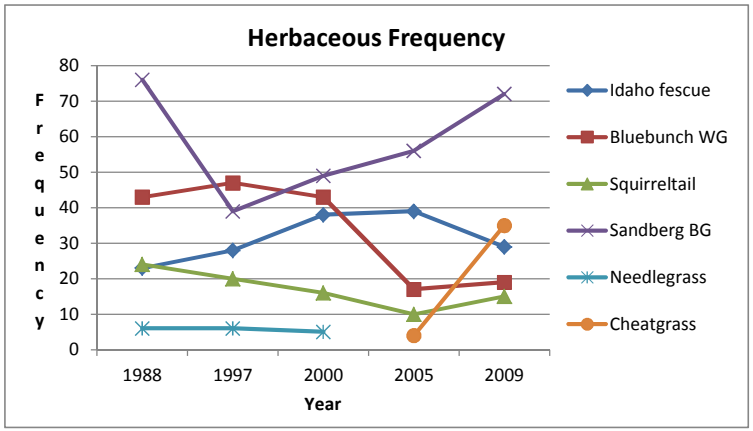
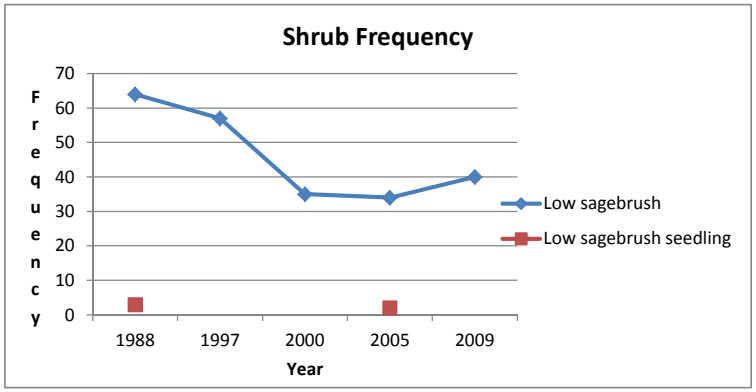
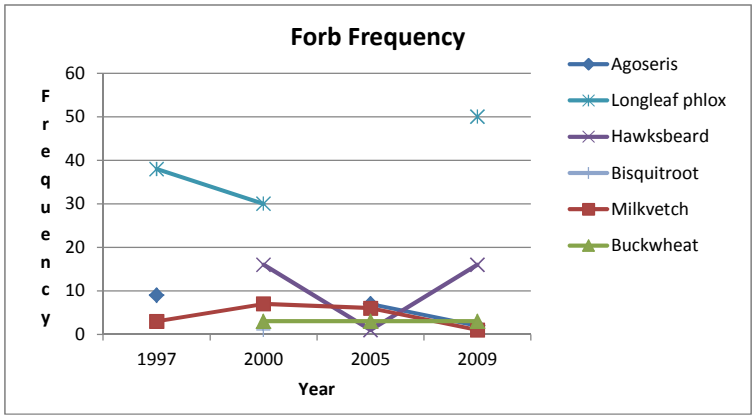
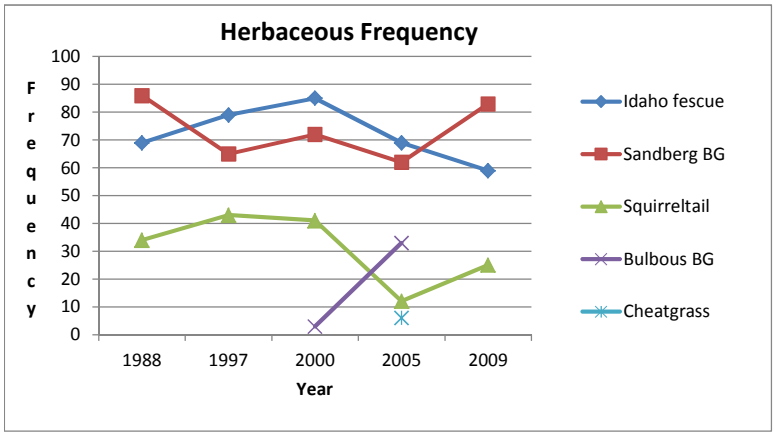
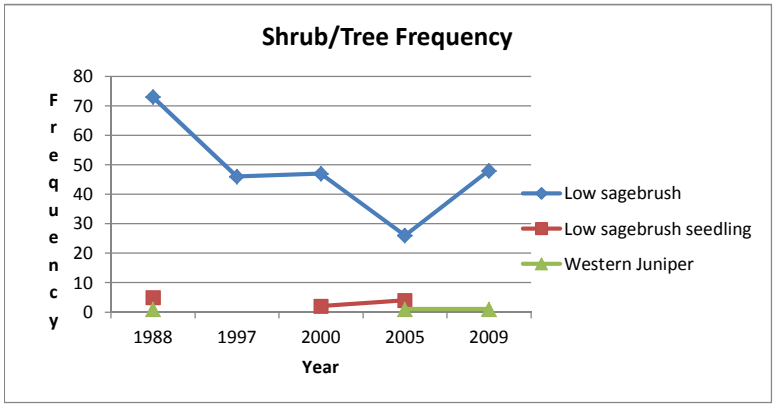


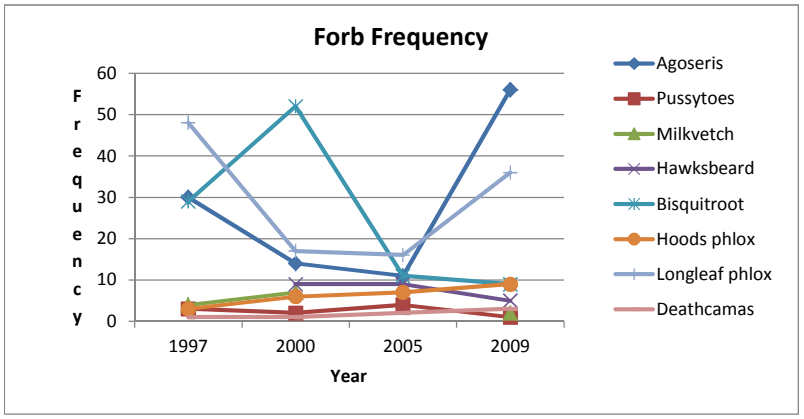




11S06W24


Herbaceous Frequency
Frequency
100
90
80
70
60
50
40
30
20
10
0
1988
1997
2000
2005
2009
Year
Idaho fescue
Sandberg BG
Squirreltail
Bulbous BG
Cheatgrass


Shrub/Tree Frequency
Frequency
80
70
60
50
40
30
20
10
0
1988
1997
2000
2005
2009
Year
Low sagebrush
Low sagebrush seedling
Western Juniper


Forb Frequency
Frequency
60
50
40
30
20
10
0
1997
2000
2005
2009
Year
Agoseris
Pussytoes
Milkvetch
Hawksbeard
Bisquitroot
Hoods phlox
Longleaf phlox
Deathcamas

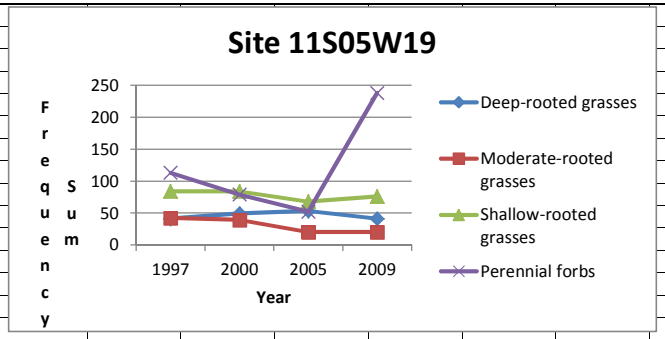
Appendix H - Figure 3 - Statistical Comparison of Differences between Frequency Means for Representative Species

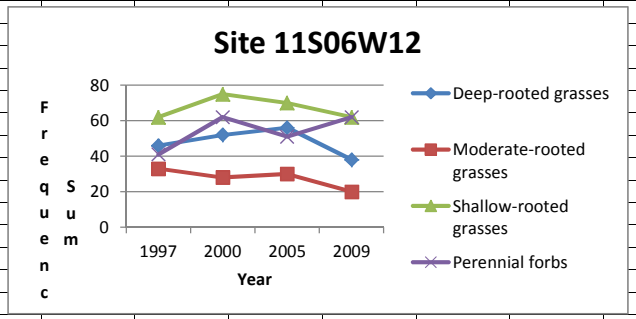
Site 11S05W19 - Idaho fescue, plot 4				**T-Test using # hits (not % frequency)**													
	Year						Sandberg bluegrass, plot 4						low sagebrush, plot 4				
Belt	1988	1997	2000	2005	2009		1988	1997	2000	2005	2009		1988	1997	2000	2005	2009
1		7	9	12	11			18	17	18	17			9	11	14	18
2		9	10	8	8			16	18	0	11			10	8	10	15
3		10	9	11	8			20	17	18	15			7	4	8	14
4		9	12	13	8			13	17	17	18			4	4	6	12
5		2	4	9	6			17	15	14	15			11	6	10	12
average		7.4	8.8	10.6	8.2			16.8	16.8	13.4	15.2			8.2	6.6	9.6	14.2
S		3.209361	2.949576	2.073644	1.788854			2.588436	1.095445	7.668116	2.683282			2.774887	2.966479	2.966479	2.48998
p			0.107939	0.194929	0.051217				1	0.406517	0.497748				0.256044	0.00257	0.003552
Site 11S06W12 - Idaho fescue, plot 4				T-Test			Sandberg bluegrass, plot 4						low sagebrush, plot 4				
Belt		1997	2000	2005	2009												
1		3	3	7	9			12	14	13	13			6	5	4	3
2		2	4	5	3			10	15	13	17			8	10	6	5
3		5	4	6	9			14	15	16	15			5	2	3	4
4		4	6	8	8			12	17	13	4			0	3	4	4
5		7	8	8	8			13	14	15	13			1	1	1	3
average		4.2	5	6.8	7.4			12.2	15	14	12.4			4	4.2	3.6	3.8
S		1.923538	2	1.30384	2.50998			1.48324	1.224745	1.414214	4.97996			3.391165	3.563706	1.81659	0.83666
p			0.241982	0.053338	0.529133				0.037841	0.351301	0.490858				0.86053	0.552889	0.748868
Site 11S05W18 - Idaho fescue, plot 4				T-Test			Sandberg bluegrass, plot 4						low sagebrush, plot 4				
Belt		1997	2000	2005	2009												
1		10	10	12	5			15	18	19	19			8	3	5	9
2		8	9	12	2			19	17	15	20			10	11	9	14
3		3	5	7	4			18	18	19	18			11	13	8	10
4		6	4	8	7			16	19	20	17			14	14	13	11
5		8	9	15	13			18	19	17	19			9	11	12	15
average		7	7.4	10.8	6.2			17.2	18.2	18	18.6			10.4	10.4	9.4	11.8
S		2.645751	2.701851	3.271085	4.207137			1.643168	0.83666	2	1.140175			2.302173	4.335897	3.209361	2.588436
p			0.58705	0.01047	0.052985				0.351301	0.798966	0.682706				1	0.460051	0.117955
Site 11S06W26 - Idaho fescue, plot 4							Sandberg bluegrass, plot 4						low sagebrush, plot 4				
Belt		1997	2000	2005	2009												
1		11	10	9	6			16	18	17	19			13	8	6	6
2		5	8	10	10			16	15	17	19			9	6	6	11
3		7	9	5	5			11	15	18	20			12	10	10	12
4		1	5	6	2			17	15	17	17			11	7	7	4
5		4	6	9	6			10	13	16	20			12	4	5	7
average		5.6	7.6	7.8	5.8			14	15.2	17	19			11.4	7	6.8	8
S		3.714835	2.073644	2.167948	2.863564			3.24037	1.788854	0.707107	1.224745			1.516575	2.236068	1.923538	3.391165
p			0.07513	0.879776	0.07513				0.358456	0.070484	0.034109				0.012913	0.704	0.41443
Site 11S06W24 - Idaho fescue, plot 4							Sandberg bluegrass, plot 4						low sagebrush, plot 4				
Belt		1997	2000	2005	2009												
1		19	19	13	11			18	17	14	17			6	7	5	11
2		19	18	14	14			15	19	14	18			11	12	7	10
3		12	12	12	11			18	20	18	18			9	6	5	8
4		16	17	12	13			17	20	19	17			11	13	4	10
5		13	19	18	10			19	20	18	19			9	9	5	9
average		15.8	17	13.8	11.8			17.4	19.2	16.6	17.8			9.2	9.4	5.2	9.6
S		3.271085	2.915476	2.48998	1.643168			1.516575	1.30384	2.408319	0.83666			2.04939	3.04959	1.095445	1.140175
p			0.388309	0.050622	0.274577				0.10454	0.018563	0.323941				0.827565	0.03934	0.002911
		Significant change at p<0.1															

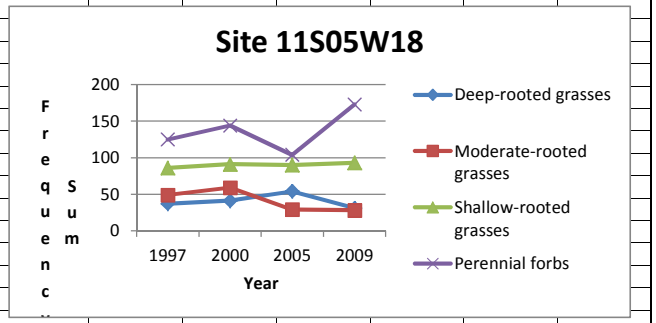
Site 11S05W19									
						1997	2000	2005	2009
Belt						longleaf phlox, plot 4			
1						9	1	2	2
2						6	6	4	4
3						5	6	2	3
4						3	5	4	2
5						2	2	3	1
average						5	4	3	2.4
S						2.738613	2.345208	1	1.140175
p							0.605967	0.351301	0.373901
Site 11S06W12						longleaf phlox, plot 4			
Belt									
1						1	0	0	0
2						2	0	1	0
3						3	3	1	0
4						2	4	3	2
5						6	5	1	1
average						2.8	2.4	1.2	0.6
S						1.923538	2.302173	1.095445	0.894427
p							0.58705	0.235496	0.070484
Site 11S05W18									
Belt						Hoods phlox, plot 4			
1						3	2	0	3
2						7	5	14	3
3						9	7	7	8
4						15	14	2	10
5						11	9	4	9
average						9	7.4	5.4	6.6
S						4.472136	4.505552	5.458938	3.361547
p							0.002838	0.590137	0.7316
	1997	2000	2005	2009					
Site 11S06W26						longleaf phlox, plot 4			
Belt	bluebunch wheatgrass, plot 4								
1	7	7	0	2		3	3	4	11
2	13	13	3	8		9	5	5	9
3	13	9	4	0		12	13	0	12
4	8	9	6	7		7	4	6	8
5	6	5	4	2		7	5	6	10
average	9.4	8.6	3.4	3.8		7.6	6	4.2	10
S	3.361547	2.966479	2.19089	3.49285		3.286335	4	2.48998	1.581139
p		0.405023	0.029134	0.811275			0.159553	0.557699	0.0292
Site 11S06W24						longleaf phlox, plot 4			
Belt									
1						6	3	0	10
2						11	3	0	9
3						10	4	8	8
4						10	4	4	6
5						11	3	4	3
average						9.6	3.4	3.2	7.2
S						2.073644	0.547723	3.34664	2.774887
p							0.002491	0.886827	0.157299

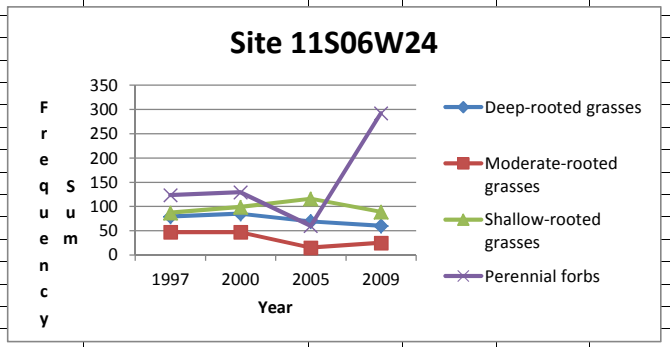
11S05W19		1997	2000	2005	2009
	Deep-rooted grasses	41	49	53	41
	Moderate-rooted grasses	42	39	20	20
	Shallow-rooted grasses	84	84	68	76
	Perennial forbs	113	79	52	238
11S06W12		1997	2000	2005	2009
	Deep-rooted grasses	46	52	56	38
	Moderate-rooted grasses	33	28	30	20
	Shallow-rooted grasses	62	75	70	62
	Perennial forbs	41	62	51	62
11S05W18		1997	2000	2005	2009
	Deep-rooted grasses	37	41	54	31
	Moderate-rooted grasses	49	59	29	28
	Shallow-rooted grasses	86	91	90	93
	Perennial forbs	125	144	104	173
11S06W26		1997	2000	2005	2009
	Deep-rooted grasses	81	86	56	48
	Moderate-rooted grasses	20	16	10	15
	Shallow-rooted grasses	70	76	85	96
	Perennial forbs	55	64	18	94
11S06W24		1997	2000	2005	2009
	Deep-rooted grasses	79	85	69	60
	Moderate-rooted grasses	47	47	15	25
	Shallow-rooted grasses	87	99	116	89
	Perennial forbs	123	129	60	292

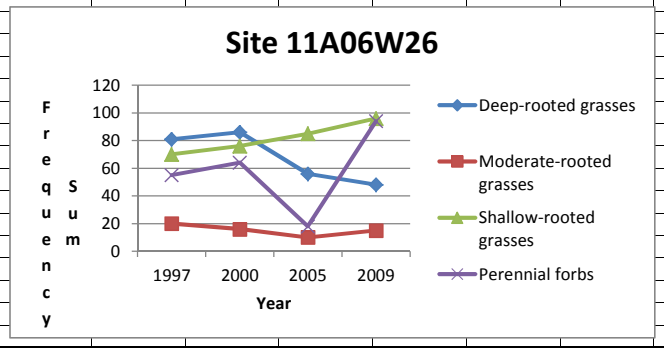
Deep-rooted grasses = FEID, AGSP, STIPA, FEOV
Moderate-rooted grasses = SIHY, DAUN, CAREX, CAGE
Shallow-rooted grasses = POSE, POBU, POAM
Perennial forb = natives only. Included Trifolium (although not clear whether it's annual or perennial)







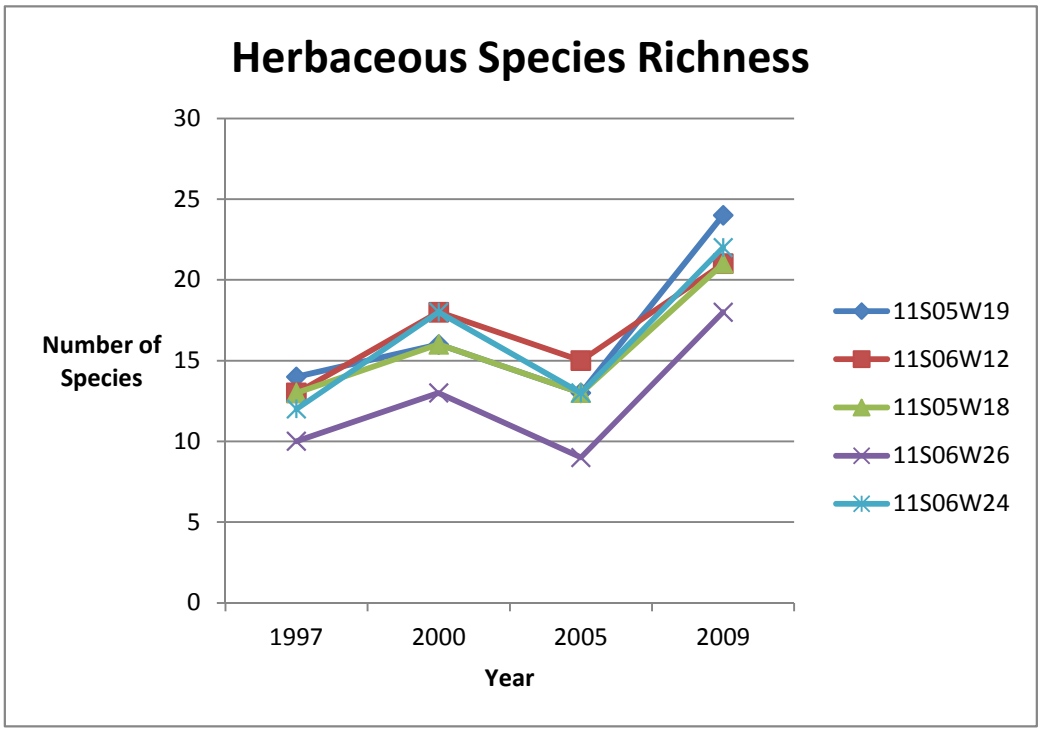




Appendix H - Figure 5 - Herbaceous Species Richness

Number of Perennial Herbaceous (graminoid and forb) Species

	1997	2000	2005	2009
11S05W19	14	16	13	24
11S06W12	13	18	15	21
11S05W18	13	16	13	21
11S06W26	10	13	9	18
11S06W24	12	18	13	22
11S05W20				15
10S06W22				13
11S06W35				14



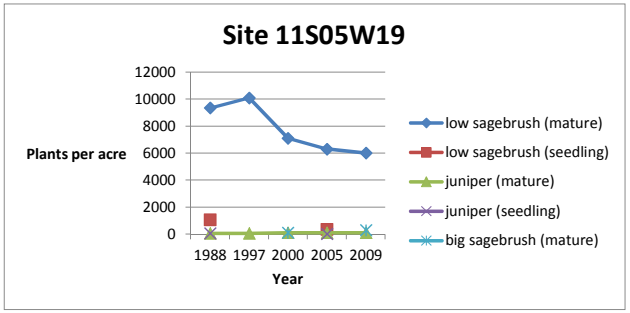
Appendix H - Figure 6 - Non-native Weed Frequency

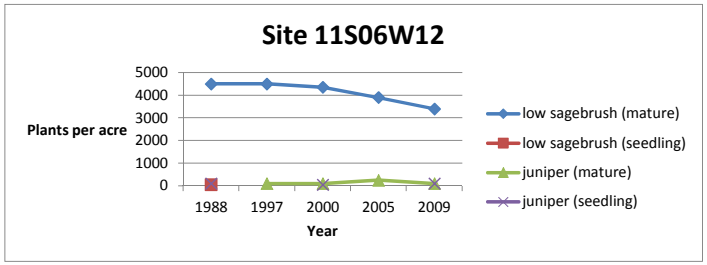
Weeds		Percent frequency, plot 4				
		1997	2000	2005	2009	
11S05W19						
	Poa bulbosa			1		
	Bromus tectorum			3	2	
	Bromus "briziformis"				49	
	Lactuca				1	
	Ranunculus testiculatus*				32	
11S06W12						
	Poa bulbosa			3	5	
	Sisymbrium			7		
11S05W18						
	Poa annua				3	
	Bromus "briziformis"				1	
	Ranunculus testiculatus*				17	
11S06W26						
	Poa bulbosa				1	
	Bromus tectorum			4	35	
	Bromus japonicus				17	
	Bromus sp.			15		
	Lactuca				3	
11S06W24						
	Poa bulbosa		3	33		
	Bromus tectorum			6		
	Bromus "briziformis"				49	
	Bromus sp.			11		
	Ranunculus testiculatus*				5	
11S05W20						
	Poa bulbosa				53	
	Bromus tectorum				3	
	Ranunculus testiculatus*				2	
	Rumex crispus**				8	
10S06W22						
	Poa bulbosa				62	
	Bromus tectorum				30	
	Bromus japonicus				52	
11S06W35						
	Bromus tectorum				1	
	*Ranunculus testiculatus (now Ceratocephala testiculata) recorded in 2009					
	is most likely the native Navarretia rather than bur buttercup.					
	**Rumex crispus is also a questionable identification. Possibly it's the					
	native Polygonum douglasii.					

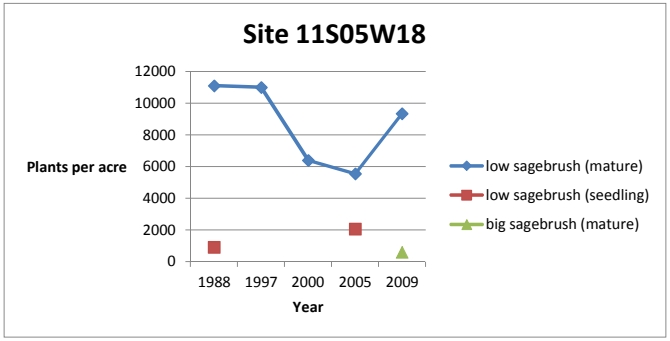
Shrub and Tree Density

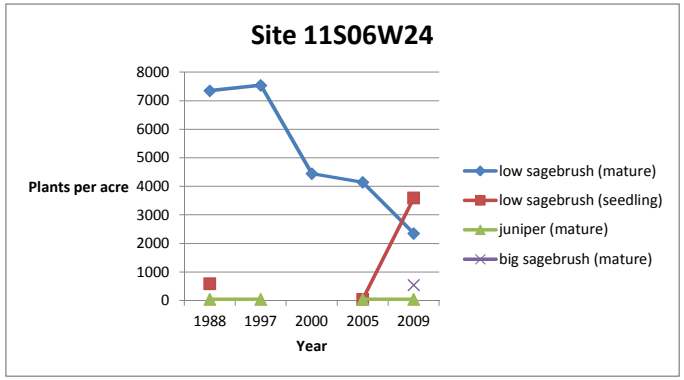
Plants per acre, from mean of two plots

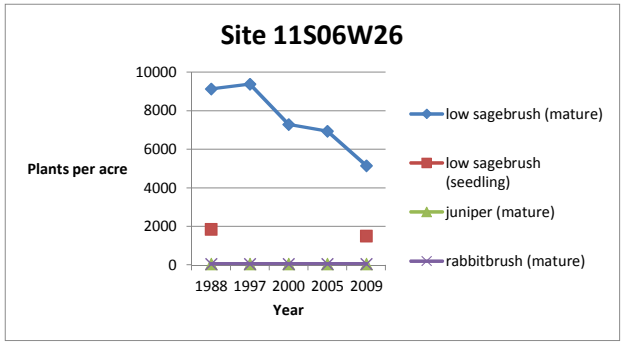
		1988	1997	2000	2005	2009
11S05W19						
	low sagebrush (mature)	9350	10100	7100	6300	6000
	low sagebrush (seedling)	1050			350	
	juniper (mature)	50	50	100	100	100
	juniper (seedling)	50			0	
	big sagebrush (mature)			100		300
11S06W12		1988	1997	2000	2005	2009
	low sagebrush (mature)	4500	4500	4350	3900	3400
	low sagebrush (seedling)	50				
	juniper (mature)		100	100	250	100
	juniper (seedling)	100		50		100
11S05W18		1988	1997	2000	2005	2009
	low sagebrush (mature)	11100	11000	6400	5550	9350
	low sagebrush (seedling)	900			2050	
	big sagebrush (mature)					600
11S06W26		1988	1997	2000	2005	2009
	low sagebrush (mature)	9150	9400	7300	6950	5150
	low sagebrush (seedling)	1850				1500
	juniper (mature)	50	50	50	50	50
	rabbitbrush (mature)	50	50	50	50	50
11S06W24		1988	1997	2000	2005	2009
	low sagebrush (mature)	7350	7550	4450	4150	2350
	low sagebrush (seedling)	600			50	3600
	juniper (mature)	50	50		50	50
	big sagebrush (mature)					550
11S05W20						2009
	low sagebrush (mature)					400
	low sagebrush (seedling)					150
	juniper (mature)					100
10S06W22						2009
	low sagebrush (mature)					2800
11S06W35						2009
	low sagebrush (mature)					6050
	big sagebrush (mature)					300
	juniper (mature)					50











Site: 11S05W18 Percent Bare Ground		
	Year	
Belt	2000	2009
1	46.25	52.5
2	18.75	33.75
3	23.75	18.75
4	25	20
5	18.75	27.7
Average:	26.5	30.54
S:	11.40175	13.69951641
T-Test P:		0.364578322
	Percent Basal Vegetation	
1	3.75	1.25
2	5	1.25
3	7.5	1.25
4	7.5	2.5
5	3.75	1.25
Average:	5.5	1.5
S:	1.895719	0.559016994
T-Test P:		0.005370442
	Percent Gravel, Rock, Persistent Litter, and Biological Soil Crust (combined)	
1	31.25	13.75
2	47.5	21.25
3	50	46.25
4	36.25	33.75
5	56.25	33.75
Average:	44.25	29.75
S:	10.25457	12.57477634
T-Test P:		0.040373
	Percent Non-persistent Litter	
1	18.75	32.5
2	28.75	43.75
3	18.75	33.75
4	31.25	43.75
5	21.25	37.5
Average:	23.75	38.25
S:	5.86302	5.347312409
T-Test P:		0.000022
	Percent Total Veg (Basal + Canopy)	
1	20	16.25
2	11.25	25
3	30	32.5
4	27.5	22.5
5	28.75	26.25
Average:	23.5	24.5
S:	7.875992	5.902859477
T-Test P:		0.785272671
	Percent Canopy Cover	
1	16.25	15
2	7.5	25
3	22.5	31.25
4	20	20
5	25	25
Average:	18.25	23.25
S:	6.823672	6.098155459
T-Test P:		0.237327248
	Percent Biological Crust	
1	3.75	0

Site: 11S05W19 Percent Bare Ground		
	Year	
Belt	2000	2009
1	21.25	35
2	16.25	11.25
3	22.5	8.75
4	22.5	10
5	30	12.5
Average:	22.5	15.5
S:	4.921255	10.99005
T-Test P:		0.277276
	Percent Basal Vegetation	
1	1.25	0
2	8.75	0
3	7.5	0
4	5	2.5
5	2.5	0
Average:	5	0.5
S:	3.186887	1.118034
T-Test P:		0.040764
1	46.24	28.75
2	50	38.75
3	38.75	22.5
4	46.25	27.5
5	48.75	36.25
Average:	45.998	30.75
S:	4.365921	6.649718
T-Test P:		0.000458
	Percent Non-persistent Litter	
1	31.25	36.25
2	25	50
3	31.25	68.75
4	26.25	60
5	18.75	51.25
Average:	26.5	53.25
S:	5.18411	12.13852
T-Test P:		0.009965
	Percent Total Veg (Basal + Canopy)	
1	21.25	23.75
2	23.75	27.5
3	27.5	25
4	36.25	40
5	20	31.25
Average:	25.75	29.5
S:	6.531175	6.531175
T-Test P:		0.163608
	Percent Canopy Cover	
1	20	25
2	15	27.5
3	20	25
4	32.5	40
5	17.5	31.25
Average:	21	29.75
S:	6.754628	6.27495
T-Test P:		0.009176
	Percent Biological Crust	
1	3.75	0

Site: 11S06W12 Percent Bare Ground		
	Year	
Belt	2000	2009
1	3.75	12.5
2	6.25	18.75
3	25	20
4	18.75	28.75
5	12.5	17.5
Average:	13.25	19.5
S:	8.776745	5.902859
T-Test P:		0.110787
	Percent Basal Vegetation	
1	5	0
2	2.5	1.25
3	6.25	1.25
4	3.75	0
5	8.75	2.5
Average:	5.25	1
S:	2.404423	1.045825
T-Test P:		0.007422
1	78.75	46.25
2	75	48.75
3	51.25	33.75
4	65	38.75
5	68.75	30
Average:	67.75	39.5
S:	10.65804	7.98436
T-Test P:		0.001349
	Percent Non-persistent Litter	
1	12.5	41.25
2	16.25	31.25
3	17.5	45
4	12.5	32.5
5	10	50
Average:	13.75	40
S:	3.061862	8.052562
T-Test P:		0.003513
	Percent Total Veg (Basal + Canopy)	
1	27.5	25
2	26.25	16.25
3	18.75	22.5
4	41.25	27.5
5	37.5	36.25
Average:	30.25	25.5
S:	9.074346	7.320775
T-Test P:		0.205758
	Percent Canopy Cover	
1	23.75	25
2	23.75	15
3	12.5	21.25
4	37.5	27.5
5	32.5	35
Average:	26	24.75
S:	9.576991	7.416198
T-Test P:		0.743042
	Percent Biological Crust	
1	1.25	2.5

Site 11S06W24 Percent Bare Ground		
	Year	
Belt	2000	2009
1	18.75	11.25
2	21.25	17.5
3	20	12.5
4	16.25	11.25
5	15	8.75
Average:	18.25	12.25
S:	2.592055	3.235545
T-Test P:		0.001187
	Percent Basal Vegetation	
1	15	0
2	10	3.75
3	6.25	2.5
4	8.75	1.25
5	10	2.5
Average:	10	2
S:	3.186887	1.425219
T-Test P:		0.013083
Percent Gravel, Rock, Persistent Litter, and Biological Soil Crust (combined)		
1	46.25	33.75
2	50	28.75
3	48.75	58.75
4	47.5	45
5	52.5	42.5
Average:	49	41.75
S:	2.404423	11.54475
T-Test P:		0.239431
	Percent Non-persistent Litter	
1	20	55
2	18.75	50
3	25	26.25
4	27.5	42.5
5	22.5	46.25
Average:	22.75	44
S:	3.579455	10.94732
T-Test P:		0.024743
	Percent Total Veg (Basal + Canopy)	
1	25	18.75
2	22.5	17.5
3	13.75	18.75
4	25	22.5
5	22.5	17.5
Average:	21.75	19
S:	4.643544	2.05396
T-Test P:		0.247178
	Percent Canopy Cover	
1	10	18.75
2	13.75	15
3	7.5	16.25
4	16.25	22.5
5	13.75	15
Average:	12.25	17.5
S:	3.468609	3.186887
T-Test P:		0.036352
	Percent Biological Crust	
1	1.25	3.75

Site 11S06W26 Percent Bare Ground		
	Year	
Belt	2000	2009
1	18.75	7.5
2	15	17.5
3	10	6.25
4	18.75	7.5
5	12.5	8.75
Average:	15	9.5
S:	3.852759	4.558646
T-Test P:		0.102813
	Percent Basal Vegetation	
1	6.25	0
2	6.25	0
3	7.5	1.25
4	5	1.25
5	7.5	0
Average:	6.5	0.5
S:	1.045825	0.684653
T-Test P:		0.000608
1	56.25	56.25
2	55	52.5
3	63.75	45
4	66.25	56.25
5	58.75	57.5
Average:	60	53.5
S:	4.841229	5.108204
T-Test P:		0.138725
	Percent Non-persistent Litter	
1	18.75	36.25
2	23.75	30
3	18.75	47.5
4	10	35
5	21.25	33.75
Average:	18.5	36.5
S:	5.18411	6.578849
T-Test P:		0.011596
	Percent Total Veg (Basal + Canopy)	
1	15	23.75
2	25	26.25
3	26.25	38.75
4	16.25	16.25
5	26.25	21.25
Average:	21.75	25.25
S:	5.63194	8.403868
T-Test P:		0.328456
	Percent Canopy Cover	
1	8.75	23.75
2	18.75	26.25
3	18.75	38.75
4	11.25	15
5	20	21.25
Average:	15.5	25
S:	5.123475	8.75
T-Test P:		0.053491

2	3.75	2.5			2	0	0			2	5	1.25			2	8.75	0								
3	2.5	1.25			3	0	1.25			3	6.25	0			3	6.25	5								
4	2.5	3.75			4	2.5	0			4	2.5	0			4	7.5	7.5								
5	2.5	0			5	2.5	0			5	11.25	3.75			5	1.25	0								
Average	3	1.5			Average:	1.75	0.25			Average:	5.25	1.5			Average:	5	3.25								
S:	0.684653	1.629800601			S:	1.677051	0.559017			S:	3.893103	1.629801			S:	3.535534	3.259601								
T-Test P:		0.144703999			T-Test P:		0.177808			T-Test P:		0.070484			T-Test P:		0.404433								
	Significant change at p<0.1																								

Appendix I. Special Status Animal Species that occur or may occur in the Pole Creek Allotment.

Species	Status[1]/ Type[2]	Key Habitat Associations
Greater Sage-grouse *Centrocercus urophasianus*	ESA-C	Sagebrush steppe
Yellow-billed Cuckoo *Coccyzus americanus*	ESA-C	Riparian
Columbia Spotted Frog *Rana luteiventris*	ESA-C	Wetlands, rivers and streams
Bald Eagle *Haliaeetus leucocephalus*	BGEA	Riparian, wetlands
Golden Eagle *Aquila chrysaetos*	BGEA	Cliffs and canyon, shrubsteppe, grasslands
Pygmy Rabbit *Brachylagus idahoensis*	BLM/2	Sagebrush steppe
Redband Trout *Oncorhynchus mykiss gibbsi*	BLM/2	Rivers and streams
Brewer's Sparrow *Spizella breweri*	BLM/3	Sagebrush steppe
Calliope Hummingbird *Stellula calliope*	BLM/3	Riparian, mountain shrub
Lewis' Woodpecker *Melanerpes lewis*	BLM/3	Juniper woodland, forests, riparian
Loggerhead Shrike *Lanius ludovicianus*	BLM/3	Shrubsteppe, mountain shrub, juniper woodlands
Sage Sparrow *Amphispiza belli*	BLM/3	Sagebrush steppe
Willow Flycatcher *Empidonax trailii*	BLM/3	Riparian, mountain shrub, juniper woodland
Ferruginous Hawk *Buteo regalis*	BLM/3	Shrubsteppe, juniper woodlands
Northern Goshawk *Accipiter gentilis*	BLM/3	Forests, juniper woodlands
Prairie Falcon *Falco mexicanus*	BLM/3	Cliffs and canyon, shrubsteppe, grasslands
Flammulated Owl *Otus flammeolus*	BLM/3	Forests, juniper woodlands
California Bighorn Sheep *Ovis canadensis californiana*	BLM/3	Canyons, sagebrush steppe, grasslands
Fringed Myotis *Myotis thysanodes*	BLM/3	Roosting/hibernation: Cliffs, rock outcrops Foraging: Sagebrush, juniper, canyon
Spotted Bat *Euderma maculatum*	BLM/3	Roosting/hibernation: Cliffs, rock outcrops Foraging: Juniper, sagebrush
Townsend's Big-eared Bat *Corynorhinus townsendii*	BLM/3	Roosting/hibernation: Caves, trees Foraging: Juniper, sagebrush, canyon
Black Throated Sparrow *Amphispiza bilineata*	BLM/4	Shrubsteppe, canyons
White-faced Ibis *Plegadis chihi*	BLM/4	Wetlands
California Myotis *Myotis caligornicus*	BLM/4	Roosting/hibernation: Caves, buildings, bark Foraging: Sagebrush, riparian, juniper

Species	Status[1]/ Type[2]	Key Habitat Associations
Brewer's Blackbird *Euphagus cyanocephalus*	BLM/5	Sagebrush steppe, wetlands, riparian, grasslands
Cassin's Finch *Carpodacus cassinii*	BLM/5	Forests, juniper woodlands
Grasshopper Sparrow *Ammodramus savannarum*	BLM/5	Grasslands
Green-tailed Towhee *Pipilo chlorurus*	BLM/5	Mountain shrub
Long-billed Curlew *Numenius americanus*	BLM/5	Grasslands, shrubsteppe
Red-naped Sapsucker *Sphyrapicus nuchalis*	BLM/5	Aspen, riparian
Sage Thrasher *Oreoscoptes montanus*	BLM/5	Shrubsteppe
Wilson's Phalarope *Phalaropus tricolor*	BLM/5	Ponds, wetlands
Swainson's Hawk *Buteo swainsoni*	BLM/5	Grasslands, shrubsteppe, agriculture
Short-eared Owl *Asio flammeus*	BLM/5	Grassland, shrubsteppe, wetlands
Western Burrowing Owl *Athene cunicularia*	BLM/5	Grasslands, shrubsteppe
Long-eared Myotis *Myotis evotis*	BLM/5	Roosting/hibernation: Trees, caves Foraging: Wetland/riparian, juniper, sagebrush
Long-legged Myotis *Myotis volans*	BLM/5	Roosting/hibernation: Rock outcrops, trees Foraging: Juniper, wetland/ riparian
Western Pipistrelle *Pipistrellus Hesperus*	BLM/5	Roosting/hibernation: Caves, rock outcrops Foraging: Juniper, sagebrush, canyon
Western Small-footed Myotis *Myotis ciliolabrum*	BLM/5	Roosting/hibernation: Caves, rock crevices, trees Foraging: Cliffs, rocky slopes
Yuma Myotis *Myotis yumanensis*	BLM/5	Roosting/hibernation: Caves, rock outcrops Foraging: Wetland, riparian, sagebrush, juniper

[1]Special status categories include Endangered Species Act Candidate (ESA-C), Bald and Golden Eagle Protection Act species (BGEA), and BLM Sensitive Species (BLM).
[2]Status Type includes Rangewide/Globally Imperiled Species (2), Regional/State Imperiled Species (3), Peripheral Species (4), and Watch Species not currently considered sensitive but may warrant status change in future (5).

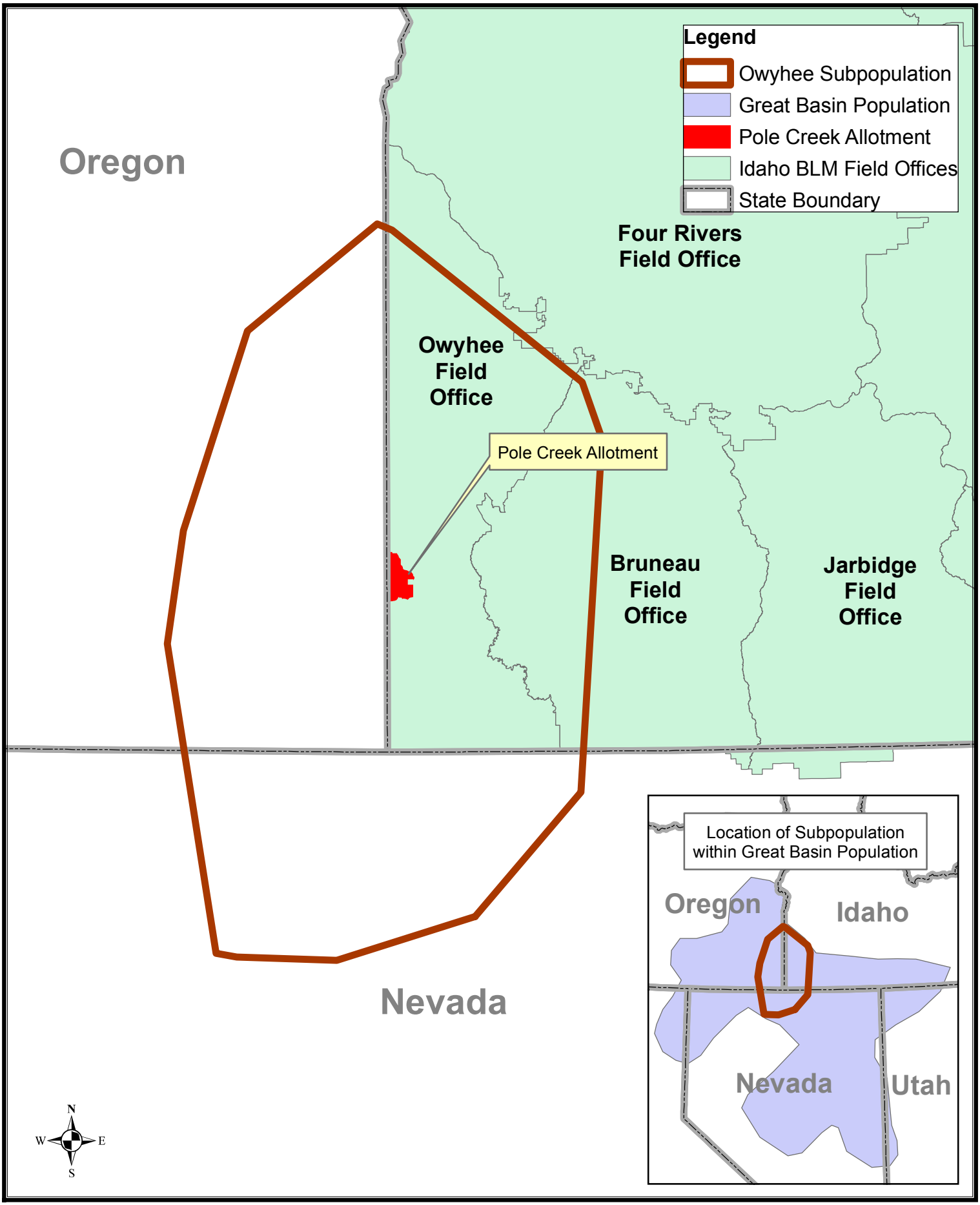
Appendix J. Migratory bird species identified by the USFWS as birds of conservation concern (BCC) and the Idaho Bird Conservation Plan as high priority breeding bird species (HPBBS) that have been documented or likely occur in the Pole Creek Allotment.

Species	**USFWS BCC[1]**	**IPIF HPBBS[2]**	**Nest Habitat - Habitat Association – Season of Use - Number of Broods**
Bald Eagle *Haliaeetus leucocephalus*	×		NA – various throughout Owyhee Uplands – winter and migratory – NA
Black-billed Magpie *Pica hudsonia*		×	Shrub – open country, savanna, brushy habitat, riparian, open woodland – yearlong – 1
Black-chinned Hummingbird *Archilochus alexandri*		×	Tree – open and riparian woodland, arid scrub – spring-summer – 2-3
Black Rosy-Finch *Leucosticte atrata*	×	×	NA – various throughout Owyhee Uplands – winter – NA
Black-throated Gray Warbler *Dendroica nigrescens*		×	Tree – open, dry coniferous forests, mtn. shrub – spring-summer – 1
Brewer's Sparrow *Spizella breweri*	×	×	Ground/shrub – sagebrush, shrubsteppe – spring-summer – 1-?
Calliope Hummingbird *Stellula calliope*	×	×	Tree/shrub – mountain meadow, willow alder thickets – spring-summer – 1
Ferruginous Hawk *Buteo regalis*	×	×	Ground/rock/tree – shrubsteppe, grasslands – spring-summer – 1
Flammulated Owl *Otus flammeolus*	×	×	Snag-cavity – forest, ponderosa pine – spring-summer – 1
Golden Eagle *Aquila chrysaetos*	×	×	Cliff – open habitats, especially in mountains and hills – yearlong and migratory – 1
Grasshopper Sparrow *Ammodramus savannarum*		×	Ground – grassland, prairie, open savanna – spring-summer – 2-3
Gray Flycatcher *Empidonax wrightii*		×	Tree – sagebrush, open woodland – spring-fall – 1-?
Greater Sage-grouse *Centrocercus urophasianus*	×	×	Ground – sagebrush, wet meadows – yearlong – 1
Green-tailed Towhee *Pipilo chlorurus*	×		Ground/shrub – thickets, riparian shrub, shrubsteppe – spring-summer – 2
Killdeer *Charadrius vociferus*		×	Ground nest – fields, meadows, pastures, fresh water margins – spring-fall – 1-2
Lark Sparrow *Chondestes grammacus*		×	Shrub/ground – grassland, savanna – spring-summer – 1
Lewis' Woodpecker *Melanerpes lewis*	×	×	Snag /cavity – riparian woodland, juniper – spring-summer – 1
Loggerhead Shrike *Lanius ludovicianus*	×	×	Shrub – fields, savanna, shrubsteppe – spring-summer – 2
Long-billed Curlew *Numenius americanus*	×	×	Ground – prairie, meadows, fresh water margins – spring-summer – 1
Northern Goshawk *Accipiter gentilis*		×	Tree – mixed, often coniferous forest, open woodland – spring-summer – 1
Plumbeus Vireo *Vireo plumbeus*		×	Tree/shrub – coniferous forest, juniper – spring-summer – 1
Prairie Falcon *Falco mexicanus*		×	Cliff – open habitat in mountainous region – yearlong and migratory – 1
Rock Wren *Salpinctes obsoletus*		×	Ground/crevice – semiarid canyons, valleys w/rock outcrops, cliffs – yearlong – 2

Species	**USFWS BCC[1]**	**IPIF HPBBS[2]**	**Nest Habitat - Habitat Association – Season of Use - Number of Broods**
Sage Sparrow *Amphispiza belli*	×	×	Ground/shrub – sagebrush, shrubsteppe – spring-summer – 2
Sage Thrasher *Oreoscoptes montanus*	×	×	Ground/shrub – sagebrush, shrubsteppe – spring-summer – 2
Sandhill Crane *Grus canadensis*		×	Ground – meadows, wetlands – spring-summer – 1?
Sharp-shinned Hawk *Accipiter striatus*		×	Tree – forest, juniper, aspen – spring-summer - 1
Short-eared Owl *Asio flammeus*		×	Ground – prairie, marsh, savanna – spring-summer – 1
Swainson's Hawk *Buteo swainsoni*		×	Deciduous tree/cliff – savanna, prairie, desert, agriculture – spring-summer – 1
Virginia's Warbler *Vermivora virginiae*	×	×	Tree/shrub – juniper, mtn. shrub – spring-summer – 1-?
White-faced Ibis *Plegadis chihi*		×	Tree/shrub/ground – marshes, shrubsteppe – spring-summer – 1-?
Willow Flycatcher *Empidonax trailii*	×	×	Tree – willow thickets – spring-fall - 1
Yellow-billed Cuckoo *Coccyzus americanus*	×		Shrub – riparian woodland and thickets, open woodland with dense thickets – Spring-summer – 1
Yellow Warbler *Dendroica petechia*		×	Tree – riparian thickets – spring-summer – 1-?

[1]U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC; USDI-USFWS 2008).
[2]Idaho Partners in Flight (IPIF) Idaho Bird Conservation Plan v. 1.0 High Priority Breeding Bird Species (HPBBS; IPIF 2000).

Appendix K - Owyhee Sage-grouse Subpopulation



0 10 20 40 Miles

The sources of the data are from Idaho-BLM Corporate Data, and the USGS.

2/24/2012

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