

**United States Department of the Interior  
Bureau of Land Management**

---

**RANGELAND HEALTH ASSESSMENT AND EVALUATION REPORT  
BUCK FLAT AMP ALLOTMENT #01122**

November 10, 2015

---

**U.S. Department of the Interior  
Bureau of Land Management  
Jarbidge Field Office  
2878 Addison Avenue East  
Twin Falls, Idaho 83301  
Phone: 208-736-2350  
FAX: 208-735-2076**



DRAFT

This page intentionally left blank.

## TABLE OF CONTENTS

<b>Allotment Information</b> .....	<b>1</b>
<b>Current Permitted Livestock Grazing Use</b> .....	<b>1</b>
<b>Allotment Profile</b> .....	<b>3</b>
Climate.....	3
Grazing Management.....	4
Vegetation.....	9
Noxious Weeds.....	15
Upland Trend Data.....	17
<b>Idaho Rangeland Health Standards Assessment</b> .....	<b>33</b>
Standard 1 (Watersheds).....	38
Rangeland Health Assessment.....	39
Evaluation of Standard 1.....	44
Standard 2 (Riparian Areas & Wetlands).....	45
Rangeland Health Assessment.....	45
Evaluation of Standard 2.....	46
Standard 3 (Stream Channel & Floodplain).....	49
Rangeland Health Assessment.....	49
Evaluation of Standard 3.....	49
Standard 4 (Native Plant Communities).....	52
Rangeland Health Assessment.....	52
Evaluation of Standard 4.....	62
Standard 5 (Seedings).....	63
Standard 6 (Exotic Plant Communities, Other than Seedings).....	64
Standard 7 (Water Quality).....	64
Rangeland Health Assessment.....	64
Evaluation of Standard 7.....	64
Standard 8 (Threatened, Endangered and BLM Sensitive Plants and Animals).....	65
Rangeland Health Assessment.....	65
Evaluation for Standard 8.....	80
<b>Literature Cited</b> .....	<b>85</b>
<b>Appendix A: Species List Accumulated During Upland Assessments</b> .....	<b>89</b>

**Appendix B: Process for Generating Sage-grouse Habitat Assessment Framework Sample Sites..... 92**

**LIST OF TABLES**

Table 1: Buck Flat Allotment Acres ..... 1

Table 2: Assessment Participants..... 1

Table 3: Acreage by pasture and ownership in the Buck Flat AMP Allotment ..... 4

Table 4: Actual Use and Utilization prior to 2008..... 7

Table 5: Actual grazing use and percent utilization since 2008 ..... 7

Table 6: Actual Use and Utilization Summary for the Buck Flat AMP Allotment..... 9

Table 7: Fire Frequency by Pasture from 1993 to 2013 ..... 10

Table 8: Buck Flat AMP Vegetation Communities in Acres and Percentage by Pasture ..... 13

Table 9: Summary of 2006 Ecological Site Inventory Production Data (Total Dry Weight, in Pounds per Acre)..... 15

Table 10: Trend Site 12S10E22 Nested Frequency Data Summary..... 20

Table 11: Trend Site 12S10E34 Nested Frequency Data Summary..... 22

Table 12: Trend Site 12S11E19 Nested Frequency Data Summary..... 24

Table 13: Trend Site 12S10E23 Nested Frequency Data Summary..... 26

Table 14: Trend Site 13S11E08 Nested Frequency Data Summary..... 28

Table 15: Trend Site 13S11E20 Nested Frequency Data Summary..... 31

Table 16: Trend Site 13S11E30 Nested Frequency Data Summary..... 33

Table 17: Standards Applicable to the Buck Flat AMP Allotment by Pasture..... 34

Table 18: Summary of 17 Rangeland Health Indicators..... 37

Table 19: Rangeland Health Attribute Rating by Site ..... 38

Table 20: Percent ground cover (top layer) at IIRH sites ..... 41

Table 21: PFC Assessment Ratings by Stream Reach and Year ..... 46

Table 22: Vegetation Item Ratings from PFC Assessments by Segment and Year in Pasture #1 47

Table 23: Vegetation Indicator Ratings from PFC Assessments by Segment and Year ..... 48  
in Pastures #3, #5 and #7 ..... 48

Table 24: Hydrology and Erosion/Deposition Item Rating from PFC Assessment Forms ..... 50  
by Segment and Year in Pasture #1 ..... 50

Table 25: Hydrology and Erosion/Deposition Item Rating from PFC Assessment Forms by Segment and Year in Pastures #3, #5 and #7 .....	51
Table 26: IIRH Site Data - Percent Vegetative Cover (Top layer).....	53
Table 27: Percent ground cover (top layer) recorded in 2013 in other areas of the Buck Flat AMP Allotment .....	54
Table 28: Percent ground cover (top layer) recorded in 2006 in other areas of the Buck Flat AMP Allotment .....	55
Table 29: IDEQ information for the Buck Flat Allotment .....	65
Table 30: Slickspot Peppergrass Potential Habitat (Acres).....	66
Table 31: Sage-grouse Attendance at Occupied Leks within Five Miles of the Buck Flat AMP Allotment, 2000-2014.....	71
Table 32: Sage-grouse Habitat Assessment Worksheet for Nesting and Early Brood Rearing Habitat (Arid Site).....	73
Table 33: Overall Habitat Suitability for BLM Sensitive Wildlife Species by Pasture.....	81

### **LIST OF FIGURES**

Figure 1: Monthly Precipitation (2004 – 2013) at the Horse Butte RAWS Station .....	3
Figure 2: Monthly Average Temperature (2004 – 2013) at the Horse Butte RAWS Station.....	4

### **LIST OF MAPS**

Map 1: Allotment Vicinity.....	2
Map 2: Range Infrastructures and Key Utilization Sites .....	6
Map 3: Fire Frequency.....	11
Map 4: Vegetation Communities and Ecological Site Inventory (ESI) Plots.....	14
Map 5: Noxious Weed Management .....	16
Map 6: Upland Trend Monitoring Sites.....	18
Map 7: Interpreting Indicators of Rangeland Health (IIRH) Sites .....	35
Map 8: Slickspot Peppergrass Potential Habitat and Areas Surveyed.....	67
Map 9: Shrubland Habitat and Sage-grouse Leks.....	70
Map 10: Sage-grouse Habitat Assessment Framework (HAF) Sites.....	72

DRAFT

This page intentionally left blank.

## ALLOTMENT INFORMATION

**Field Office:** Jarbidge Field Office (JFO)

**Name of Permittee:** Devil Creek Ranch, Inc.

**Allotment Name/Number:** Buck Flat AMP (01122)

**Date of Field Assessment:** June 17, 18 and 27, 2013

**Stream Miles on Public Land:** 10.2 miles of perennial stream

**Table 1: Buck Flat Allotment Acres**

Total Acres	BLM Acres	State Acres	Private Acres	Other Acres
24,158	21,937	969	1,252	0

**Table 2: Assessment Participants**

Name	Position
Kate Crane	TFD Fisheries Biologist
Jim Klott	JFO Wildlife Biologist
Michael Haney	JFO Botanist
Dan Strickler	JFO Rangeland Management Specialist
Andrea J. Cox	JFO Rangeland Management Specialist
Bonnie Claridge	IDSO Fisheries Biologist
Bonnie Ross	TFD GIS Specialist

## CURRENT PERMITTED LIVESTOCK GRAZING USE

**Total Active Use:** 1,716 AUMs

**Livestock Type:** Cattle

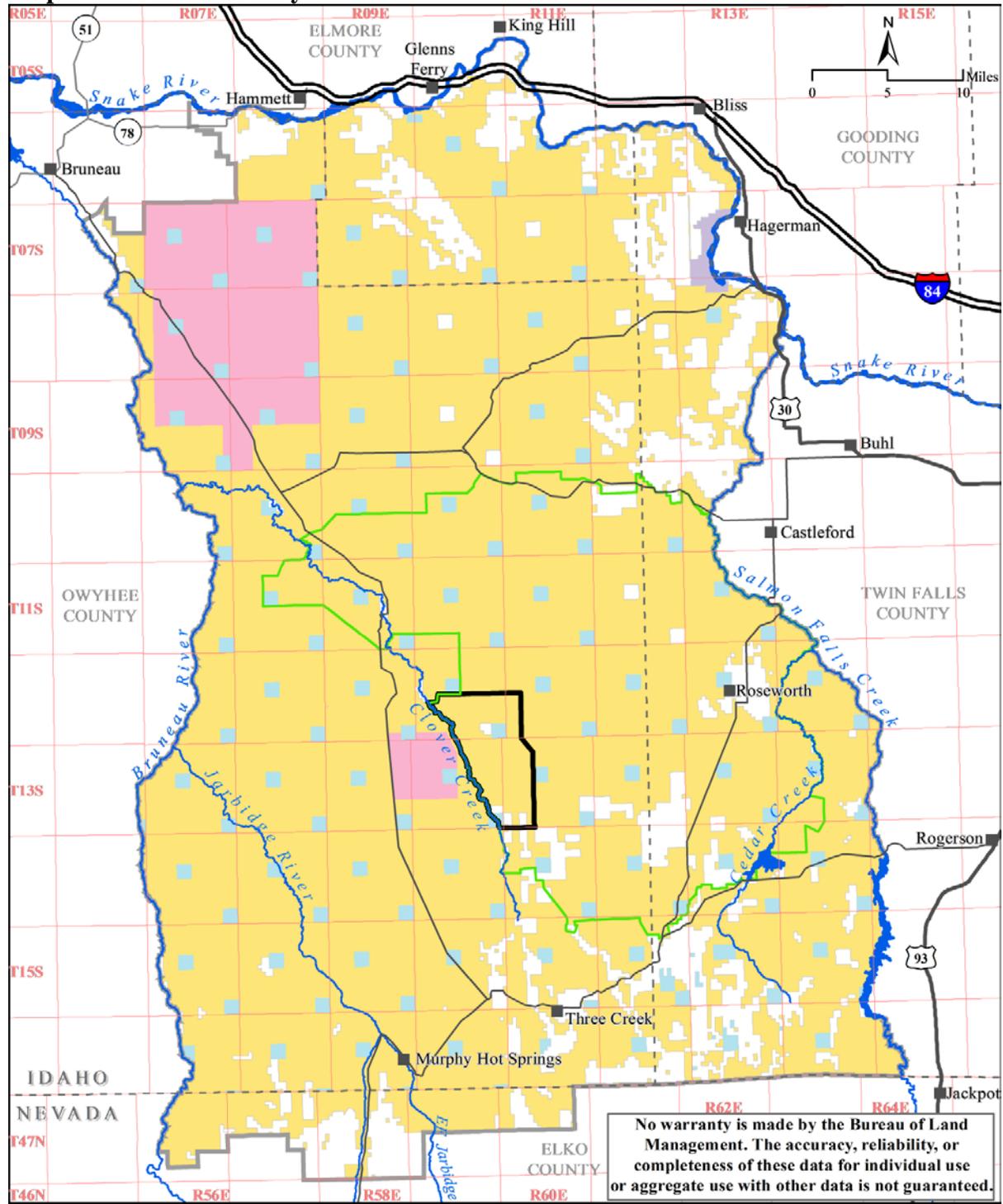
**Livestock Numbers:** 550 Cattle

**Season of Use:** 03/15 to 07/15

**Current Land Use Plan:** 2015 Jarbidge Resource Management Plan (RMP)

**Current Stocking Level:** 13.0 Acres/AUM

**Map 1: Allotment Vicinity**



Buck Flat AMP Allotment	Bureau of Land Management	Private; other
Devil Creek Sub-region	Military, Department of Defense	State
	National Park Service	Map projection: UTM zone 11 NAD 1983

## ALLOTMENT PROFILE

The Buck Flat AMP Allotment is located approximately 15 miles west of Roseworth, Idaho (Map 1). The elevation ranges from approximately 4,600 feet to 5,200 feet.

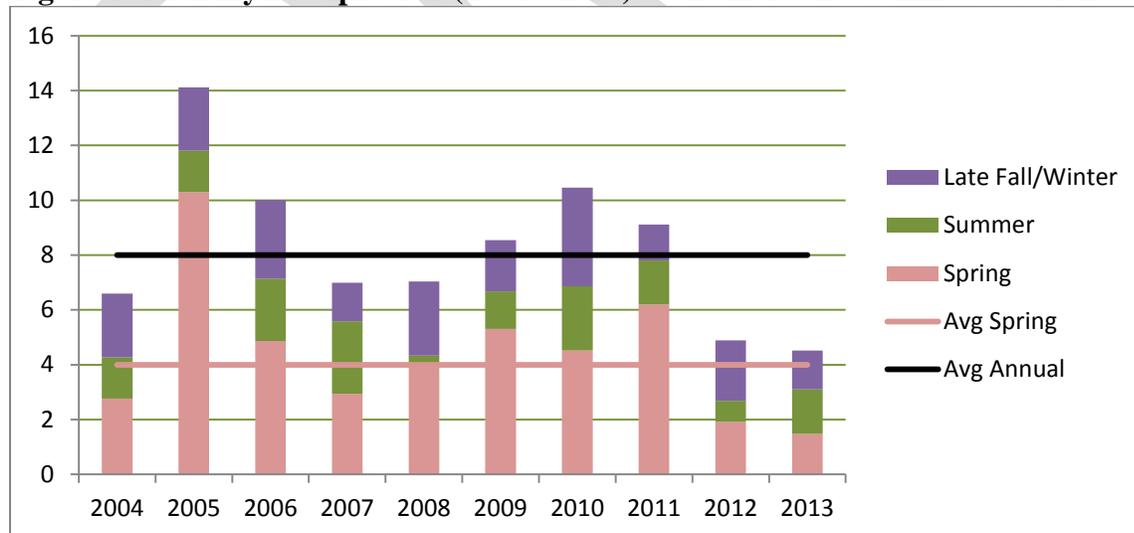
### Climate

Climatic conditions in south central Idaho are characterized by low humidity, clear skies, large diurnal variation in temperature, and wind patterns reflecting the westerly direction of the prevailing storm track. Annual rainfall in the Buck Flat AMP Allotment ranges from 8 to 12 inches. The bulk of the moisture typically falls as rain and snow from late fall through late spring.

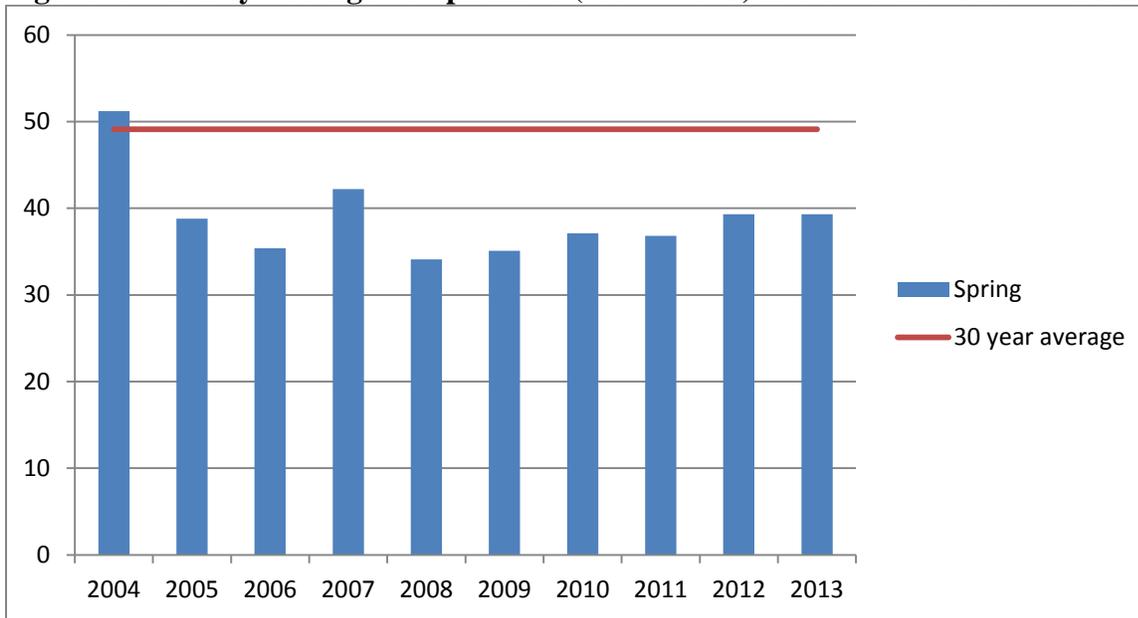
Weather data collected at the Horse Butte RAWS station is used to assess precipitation and temperature trends from 2004 to 2013. The RAWS station is located in an 8 to 12 inch precipitation zone approximately 3 miles north of the allotment boundary. The thirty-year annual average precipitation at the Horse Butte RAWS station is 8.1". Annual precipitation at the station was below the thirty-year average during five of the ten years, especially in 2012 and 2013 (Figure 1). Total rainfall in 2012 was 4.89" and in 2013 it was 4.52". Rainfall was above the thirty-year average the remaining years. Moisture exceeded the thirty-year average by at least two inches in 2005 (14.12), 2006 (10.1"), and 2010 (10.46).

The thirty- year average for rain that fell during the growing season (March–June) is 4". Growing season precipitation was below the thirty-year average during four of the ten years (2004, 2007, 2012, and 2013). Rainfall was especially low in 2012 (1.92") and 2013 (1.48"). Spring rainfall was above average in 2005 and 2011 (2" or more above the spring average). Except for 2004, temperatures during the growing season were cooler than the thirty-year average (Figure 2).

**Figure 1: Monthly Precipitation (2004 – 2013) at the Horse Butte RAWS Station**



**Figure 2: Monthly Average Temperature (2004 – 2013) at the Horse Butte RAWs Station**



**Grazing Management**

The Buck Flat AMP Allotment is divided into seven pastures (Table 3). The allotment is fenced on the north, east, and south sides. Clover Creek and the associated canyon serve as the west boundary for the allotment. In addition to water gaps along Clover Creek, an underground pipeline and water trough system provides livestock water to each pasture (Map 2). Cattle are permitted to graze the allotment from March 15 to July 15 with a permitted active use of 1,716 AUMs.

**Table 3: Acreage by pasture and ownership in the Buck Flat AMP Allotment**

Pasture Name	BLM	State	Private	Total*
1	4,504	0	0	4,504
2	4,513	640	320	5,473
3	2,642	0	0	2,642
4	2,897	0	0	2,897
5	2,540	0	0	2,540
6	4,054	0	320	4,374
7	707	320	600	1,637
<b>Allotment Total</b>	<b>21,857</b>	<b>960</b>	<b>1,240</b>	<b>24,057</b>

\*Total acres may not match the sum of individual ownership acres due to rounding

Historically, both cattle and sheep have used what is now is the Buck Flat AMP Allotment and the season of use was generally spring through summer with winter use during some years. Cattle and sheep were both trailed through the allotment and prior to the 1960’s, the Buck Flat Allotment was part of a larger common use area that did not contain any fences. When this common use area was utilized, most of the cattle concentrated in the western half of what is now the Buck Flat AMP Allotment because the only water available was along Clover Creek. In the

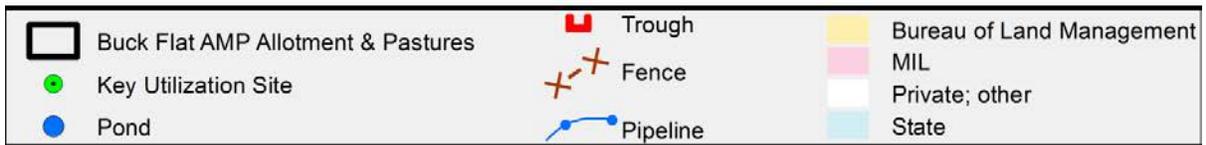
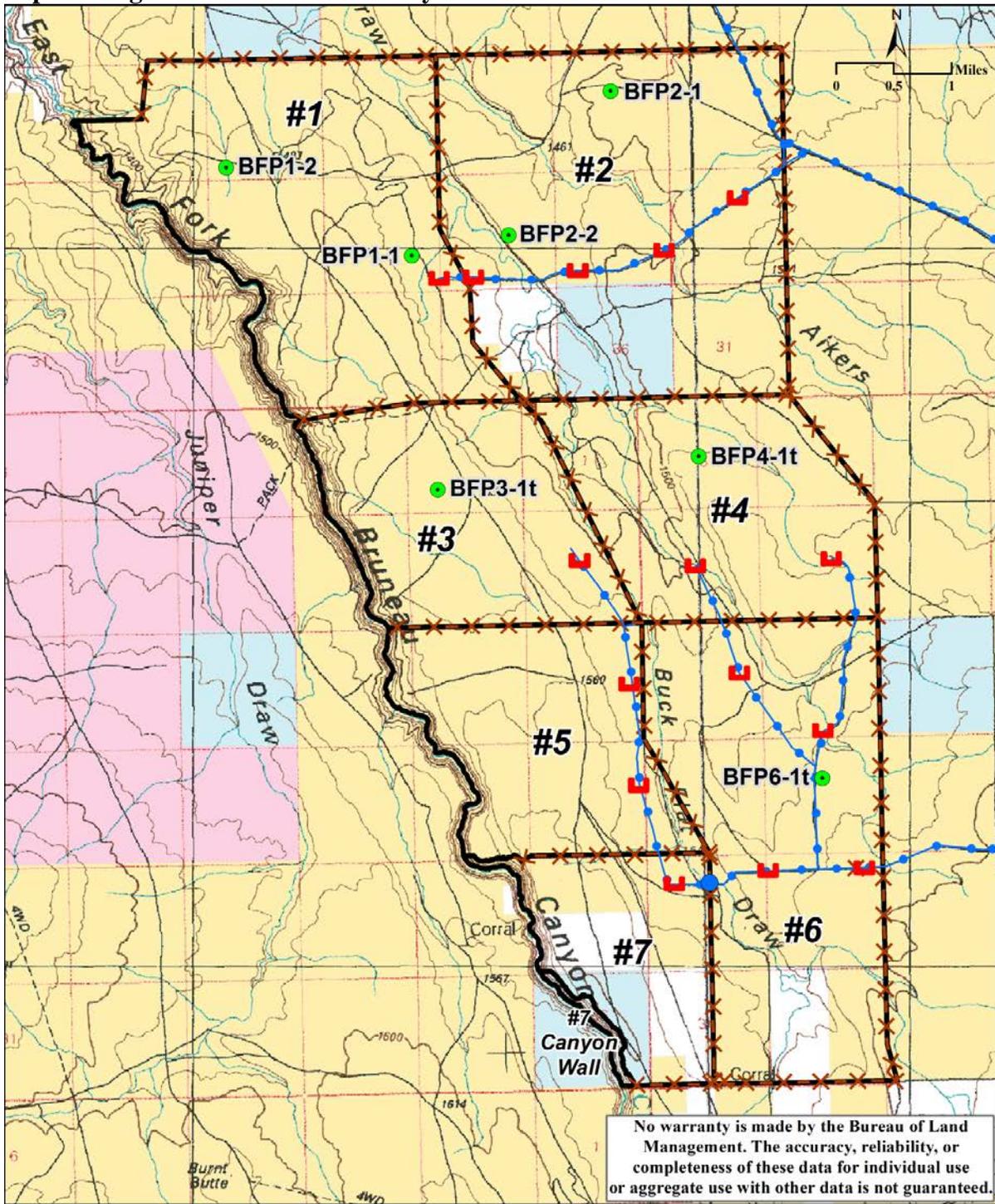
early 1960's, pipelines and upland watering sources were constructed in the eastern part of the allotment, improving cattle distribution (Map 2).

Through the late 2000s, the Buck Flat AMP Allotment was managed under the Devil Creek Allotment Management Plan (AMP) which was approved on January 16, 1970. The AMP established a rest rotation grazing system where each pasture was to receive season long rest every fourth year. The AMP also provided for a season of use within the allotment from April through December. However, the AMP did not establish a limit on AUMs within the allotment, and states:

*“Pastures may be utilized to their fullest extent consistent with the guidelines set out in this plan. The limiting stocking rate will be the condition of the cattle as determined by the range user. Likewise, any adjustment in period of use will be made by the discretion of the range user. Adjustments will be based on actual use records, range response, and success of the proposed management practices.”*

The 1987 Jarbidge Resource Management Plan proposed an increase of permitted AUMs from 1,716 AUMs to 2,667 AUMs, based on the five year average of actual grazing use. However, a permit authorizing the increase was not issued. Since the implementation of the AMP in 1970, the allotment has typically been grazed by cattle each year from mid-March through mid-July. Actual use records prior to 2008 were not reported by pasture; therefore, documentation for whether the rest rotation outlined in the AMP has been followed each year is lacking.

**Map 2: Range Infrastructures and Key Utilization Sites**



The Buck Flat AMP Allotment is subject to Chief U. S. District Judge B. Lynn Winmill’s Decision and Order of February 26, 2009. Under the order, the Bureau of Land Management (BLM) is directed to adjust livestock grazing to maintain and enhance sage-grouse, pygmy rabbit, and slickspot peppergrass habitat. A rest rotation system was initiated in 2009 in response to the Court Order. Within the rest rotation, an emphasis has been placed on pastures or areas containing key sage-grouse nesting habitat. The livestock grazing schedule and rotation is outlined each year in an Annual Grazing Agreement. Wildfires have greatly influenced the grazing rotation within the allotment since 2007. The allotment has continued to be grazed between mid-March and mid-July, with some of the pastures receiving season long rest each year.

A summary of actual use and percent utilization for each pasture within the Buck Flat AMP Allotment from 2004 to 2013 can be seen in Tables 4 and 5. Utilization data or actual grazing use by pasture is not available prior to 2008. Subsequent to the 2009 Court Order, actual use in the allotment has closely followed the grazing schedule outlined in the Annual Grazing Agreements. Utilization was measured on a variety of native grass species including bluebunch wheatgrass (*Pseudoroegneria spicata*), squirreltail (*Elymus elymoides*), Thurber’s needlegrass (*Achnatherum thurberianum*), and Sandberg bluegrass (*Poa secunda*). Utilization data was collected using the Height-Weight Method (Cooperative Extension Service et al., 1999). Locations of key utilization sites are shown in Map 2.

**Table 4: Actual Use and Utilization prior to 2008**

Year	Actual Use*	Percent Utilization
2004	1,069	-
2005	1,165	-
2006	1,117	-
2007	1,121	-

\*Actual Use by pasture is not available these years.

-Utilization data was not recorded.

**Table 5: Actual grazing use and percent utilization since 2008**

Pasture	Year	Actual Use		Percent Utilization			
		Season of Use	AUMs	Bluebunch wheatgrass	Squirreltail	Thurber’s needlegrass	Sandberg bluegrass
#1	2008	Early Spring	407	-	-	5%	9%*
	2009	Late Spring/Summer	624	-	-	39%	1%
	2010	Rest	Rest	-	-	-	-
	2011	Early Spring	598	-	-	1%	-
	2012	Rest	Rest	-	-	-	-
	2013	Early Spring	826	-	-	5%	-
#2	2008	Early Spring/Late Spring	180	-	-	3%	7%*
	2009	Early Spring/Late Spring	576	-	-	-	0%
	2010	Rest	Rest	-	-	-	-
	2011	Early Spring	263	-	-	-	-
	2012	Late Spring	61	-	-	-	-

Pasture	Year	Actual Use		Percent Utilization			
		Season of Use	AUMs	Bluebunch wheatgrass	Squirreltail	Thurber's needlegrass	Sandberg bluegrass
	2013	Early Spring	33	-	-	15%	-
#3	2008	Late Spring	261	-	-	-	-
	2009	Early Spring/Late Spring	226	-	42%	49%	-
	2010	Rest	Rest	-	-	-	-
	2011	Rest	Rest	-	-	-	-
	2012	Late Spring	92	-	-	0%	-
	2013	Early Spring/Late Spring	185	-	-	-	-
#4	2008	Late Spring/Summer	219	-	-	-	-
	2009	Late Spring	57	-	-	-	45%
	2010	Late Spring	97	-	-	-	-
	2011	Late Spring	290	-	-	-	-
	2012	Early Spring/Late Spring	290	-	-	19%	-
	2013	Rest	Rest	-	-	-	-
#5	2008	Rest	Rest	-	-	-	-
	2009	Rest	Rest	-	-	-	-
	2010	Early Spring/Late Spring	455	-	-	-	-
	2011	Late Spring	201	-	-	-	-
	2012	Rest	Rest	-	-	-	-
	2013	Late Spring	221	-	-	-	-
#6	2008	Rest	Rest	-	-	-	3%
	2009	Rest	Rest	-	-	-	-
	2010	Early Spring/Late Spring	90 469	-	-	31%	19%
	2011	Rest	Rest	5%	-	4%	-
	2012	Early Spring Late Spring Late Spring	566 46 4	-	-	17%	-
	2013	Rest	Rest	-	-	19%	-
#7	2008	Rest	Rest	-	-	-	-
	2009	Rest	Rest	-	-	-	-
	2010	Early Spring	316	-	-	-	-
	2011	Late Spring	202	-	-	-	-
	2012	Rest	Rest	-	-	-	-
	2013	Late Spring	221	-	-	-	-

Early Spring Use (3/15–4/30); Late Spring Use (5/1–6/20); Summer Use (6/21 – 8/10)

\*Utilization was taken at more than one location and results were averaged

-Utilization data not recorded, or species is not present or is not a key species for utilization monitoring.

A summary of actual use and average utilization for the Buck Flat AMP Allotment from 2004 to 2013 can be seen in Table 6. Since 2004, actual use data within the Buck Flat AMP Allotment has averaged 1,258 AUMs.

**Table 6: Actual Use and Utilization Summary for the Buck Flat AMP Allotment**

Year	Actual Use (AUMs)	Average Utilization			
		Bluebunch wheatgrass	Squirreltail	Thurber's needlegrass	Sandberg bluegrass
2004	1,069	-	-	-	-
2005	1,165	-	-	-	-
2006	1,117	-	-	-	-
2007	1,121	-	-	-	-
2008	1,067	-	-	4%	6%
2009	1,483	-	42%	44%	23%
2010	1,427	-	-	31%	19%
2011	1,554	5%	-	3%	-
2012	1,092	-	-	9%	-
2013	1,486	-	-	13%	-

-Utilization data not recorded, or species is not present or is not a key species for utilization monitoring.

The JFO livestock trailing EA (EA# DOI-BLM-ID-T010-2012-0004-EA) analyzed trailing that could be authorized along primitive roads within the Buck Flat AMP Allotment. The EA analyzed trailing for Three Creek Ranch, Inc. for up to 750 cattle along a primitive road through Pastures #1, #3, #5, and #7. Three Creek Ranch, Inc. trails approximately 750 cattle south along this route in the spring and back north in the fall. A trailing route along another primitive road was also analyzed to connect this route to the main Grassy Hills Road to the east.

### **Vegetation**

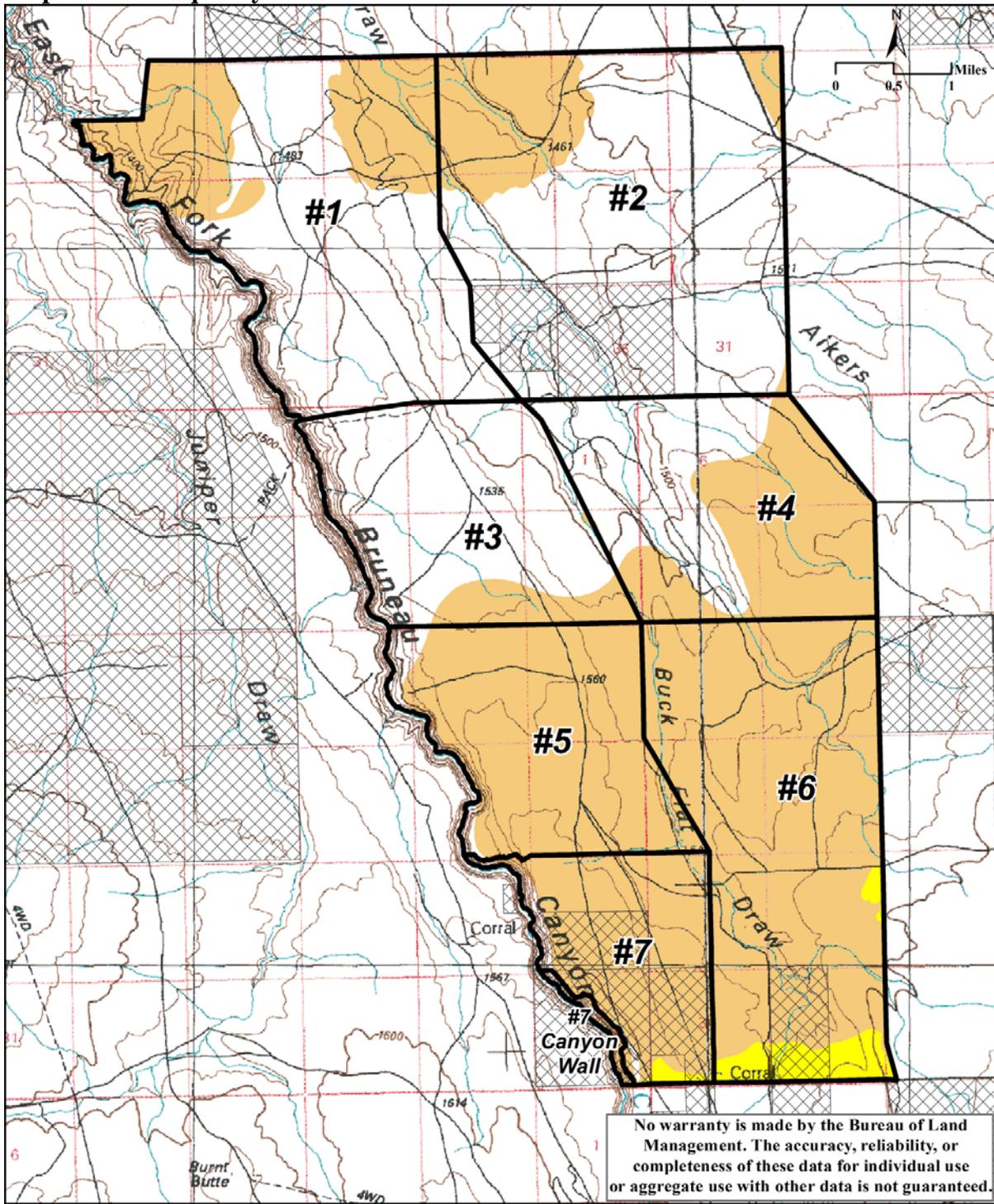
Vegetation in the Buck Flat AMP Allotment was initially mapped in 2006 using field observations, field cover data, and 2004 National Agriculture Imagery Program (NAIP) imagery. The vegetation map was updated in 2013 using field observations and NAIP imagery (Map 4). Vegetation communities were classified and mapped based on dominant plant cover using a minimum mapping unit of 20 acres, which is appropriate for landscape-level planning but is not intended to show the complexity of vegetation communities at a finer-scale. With this, fifty-three vegetation communities were classified and mapped based on dominant plant cover. These vegetation communities were subsequently organized into five classes and six sub-classes according to national standards (Grossman et al., 1998), with the exception of evergreen shrublands dominated by sagebrush; these communities were defined as having 10 percent or more shrub cover rather than the national standard of more than 25 percent shrub cover. This was done to provide consistency with defined habitat needs (Wisdom et al., 2000) and proposed management objectives for greater sage-grouse (sage-grouse).

Plant communities within the Buck Flat AMP Allotment have been modified. In the early 1960's, the southeastern part of the allotment was sprayed to control brush; however, the treatment was not successful. Prescribed fires were performed in the northeastern and southeastern part of the allotment in the early 1980's. The result was the creation of small, patchy burns scattered throughout those portions of the allotment. The southwest portion of the allotment was also treated with prescribed fire in the early 1980's and that resulted in a large area of continuous burn.

**Table 7: Fire Frequency by Pasture from 1993 to 2013**

<b>Pasture</b>	<b>Number of Times Burned 1993 - 2013</b>	<b>Acres of Pasture</b>	<b>Percentage of Pasture</b>
#1 (4,505 acres)	0	3,043	68%
	1	1,461	32%
#2 (5,473 acres)	0	3,501	64%
	1	1,016	19%
#3 (2,642 acres)	0	2,289	87%
	1	354	13%
#4 (2,897 acres)	0	1,366	47%
	1	1,532	53%
#5 (2,540 acres)	0	147	6%
	1	2,394	94%
#6 (4,374 acres)	0	0	0%
	1	3,807	85%
	2	248	6%
#7 (1,636 acres)	0	44	3%
	1	698	43%
	2	29	2%

**Map 3: Fire Frequency**



Six different wildfires have occurred within the allotment since 1958 and various drill and aerial seeding efforts have been undertaken to rehabilitate the burned areas. Two of the six fires have occurred since 2002, including the most recent Horse Butte 2 Fire of 2013 that affected Pastures #1 and #2 (Map 3). Records indicate that some areas of the allotment have been drill seeded and aerially seeded with a variety of native and non-native species. Areas within each pasture have been seeded following wildfires that have occurred since 1995.

The 1958 Saylor Creek Fire burned approximately 370 acres (7%) of Pasture #2. No fire rehabilitation information is available for this fire.

The 1973 Clover Flat Fire burned approximately 2,183 acres (48%) of Pasture #1, 734 acres (66%) of Pasture #3, and 83 acres (3%) of Pasture #5. There was a fire rehabilitation plan for this fire but none of the affected areas within the Buck Flat AMP Allotment were designated for reseeded.

The 1973 Horse Butte Fire burned approximately 320 acres (6%) of Pasture #2, 240 acres (9%) of the Pasture #3, 2,455 acres (85%) of Pasture #4, 1,520 acres (60%) of Pasture #5, 4,374 acres (100%) of Pasture #6, and 1,636 acres (100%) of Pasture #7. No fire rehabilitation information is available for this fire.

The 1999 Buck Fire burned approximately 820 acres (18%) of Pasture #1. Following the fire, the affected area was aerially sprayed with Oust® herbicide and aerially seeded with a mix of Wyoming big sagebrush, Appar Lewis flax, and Delar small burnett.

The 2007 Murphy Complex Fire burned approximately 340 acres (13%) of Pasture #3, 1,575 acres (54%) of Pasture #4, 2,475 acres (97%) of Pasture #5, 4,374 acres (100%) of Pasture #6, and 1,636 acres (100%) of Pasture #7. Following the fire, portions of Pastures #5, #6, and #7 were drilled seeded with a mix of Sandberg bluegrass, bottlebrush squirreltail, bluebunch wheatgrass, Appar Lewis flax, alfalfa, and sainfoin. In addition, portions of all affected pastures within the allotment were aerially seeded with Wyoming big sagebrush.

The 2013 Horse Butte 2 Fire burned approximately 625 acres (14%) of Pasture #1 and 910 acres (17%) of Pasture #2. The burned area within the Buck Flat AMP Allotment was drill seeded with a mix of Anatone bluebunch wheatgrass, Siberian wheatgrass, Sandberg bluegrass, bottlebrush squirreltail, Eski sainfoin, Western yarrow, and Ladak alfalfa.

As a result of the fires and seeding efforts, plant communities within the Buck Flat AMP Allotment have been modified. As a result of these treatments, the allotment is currently vegetated by both native and non-native perennial grass species (Table 6, Map 4). The majority of Pastures #1, #2 and #3 contain a brush overstory. Areas of the allotment also contain a forb component as shown in the 2013 Sage-grouse Habitat Assessment Framework (HAF) data and are further described in the 2013 Interpreting Indicators of Rangeland Health (IIRH) field observations.

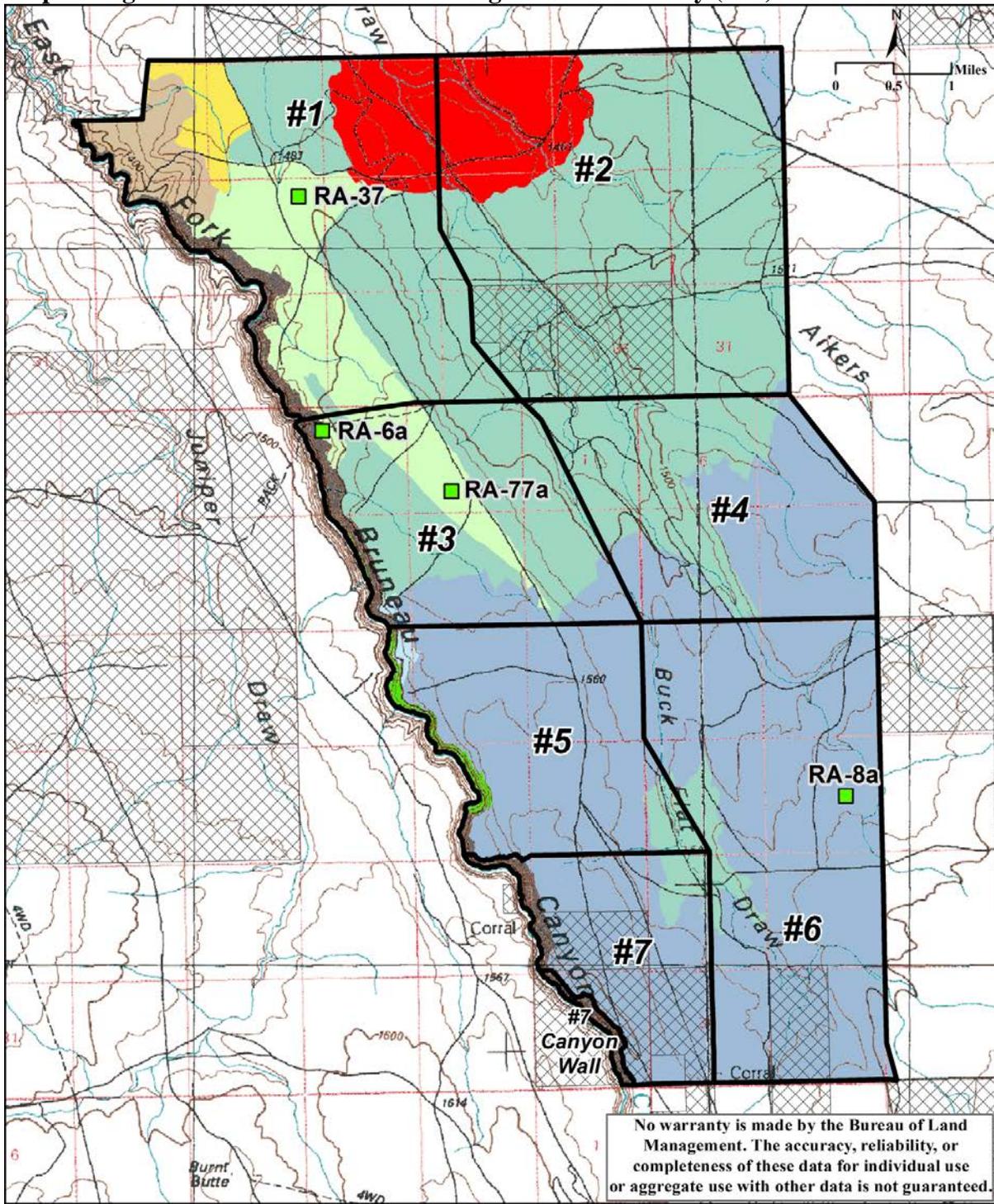
**Table 8: Buck Flat AMP Vegetation Communities in Acres and Percentage by Pasture**

Vegetation Community	Pasture						
	#1	#2	#3	#4	#5	#6	#7
Wyoming big sagebrush/Bluegrass	1,685 (37%)	3,496 (77%)	1,543 (58%)	1,328 (46%)	138 (5%)	207 (5%)	130 (17%)
Recent Burn*	625 (14%)	910 (17%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Rabbitbrush/Bluegrass	1,189 (26%)	5 (0.1%)	468 (18%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Juniper	0 (0%)	0 (0%)	23 (1%)	0 (0%)	119 (5%)	0 (0%)	13 (2%)
Crested wheatgrass	295 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Bluegrass	0 (0%)	114 (3%)	454 (17%)	1,570 (54)	2,228 (88%)	3,847 (95%)	578 (75%)
Bluebunch wheatgrass	0 (0%)	0 (0%)	19 (1%)	0 (0%)	42 (2%)	0 (0%)	0 (0%)
Breaks	246 (5%)	0 (0%)	135 (5%)	0 (0%)	15 (1%)	0 (0%)	48 (6%)
Barren	0 (0%)	4 (0.1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Annual	475 (11%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

\* Areas classified as Recent Burn that have burned within the past two years and have not been reevaluated for vegetation community classification

Four Ecological Site Inventory (ESI) sites are located within the Buck Flat AMP Allotment (two sites in Pasture #3 and one in each of Pastures #1 and #6). Site RA-8a, located in Pasture #6, burned in 2007. Vegetative data collected at the other three sites in 2006 indicate that the vast majority of native areas in the allotment are in late seral condition. Vegetative production data recorded during the 2006 ESI is summarized in Table 9. Due to differences in sampling locations and methodology (e.g. number of transects per site and number of points per transect) among the 2006 ESI data, the 2013 HAF data, and the 2013 (Step Point Method, BLM, 1996) data, statistical tests cannot be used to analyze vegetative cover across years. However, the data can be used to describe general similarities or differences in vegetation between years or locations within the allotment.

**Map 4: Vegetation Communities and Ecological Site Inventory (ESI) Plots**



Buck Flat AMP Allotment & Pastures	Annual	Crested	Rabbitbrush/Bluegrass
Non-BLM Land	Bluebunch	Juniper	Breaks, Barren
ESI Plot	Bluegrass	WY Sage/Bluegrass	Recent Burn
			Horse Butte 2 - 2013

**Table 9: Summary of 2006 Ecological Site Inventory Production Data (Total Dry Weight, in Pounds per Acre)**

Vegetation Class	Species	Site			
		Pasture #1	Pasture #3	Pasture #3	Pasture #6
		2006 ESI RA-37	2006 ESI RA-6a	2006 ESI RA-77a	2006 ESI RA-8a
<b>Perennial Grasses</b>	Bluebunch wheatgrass	28.7	8.2	0	9.2
	Bottlebrush squirreltail	9.1	20.4	13.2	2.4
	Indian ricegrass	0	2.7	0	0
	Needle and thread	0	0	1.4	0
	Sandberg bluegrass	173.9	22.4	95.6	43.3
<b>Annual Grasses</b>	Cheatgrass	0	0.9	0	0
<b>Perennial Forbs</b>	Ballhead ipomopsis	0	4.0	0	0
	Longleaf phlox	0	0.7	1.2	0
	Yellow salsify	0	1.7	0	0
	Spiny phlox	8.9	0	0	0
<b>Annual Forbs</b>	Clasping pepperweed	11.0	0	0	0
<b>Shrubs</b>	Basin big sagebrush	0	0	19.0	0
	Rubber rabbitbrush	7.0	77.2	184.3	203.9
	Wyoming big sagebrush	0	0	37.9	56.1
	Yellow rabbitbrush	347.7	161.8	0	0
<b>TOTAL</b>		<b>586.3</b>	<b>300.0</b>	<b>352.6</b>	<b>314.9</b>

\* Site burned during the 2007 Murphy Complex Fires

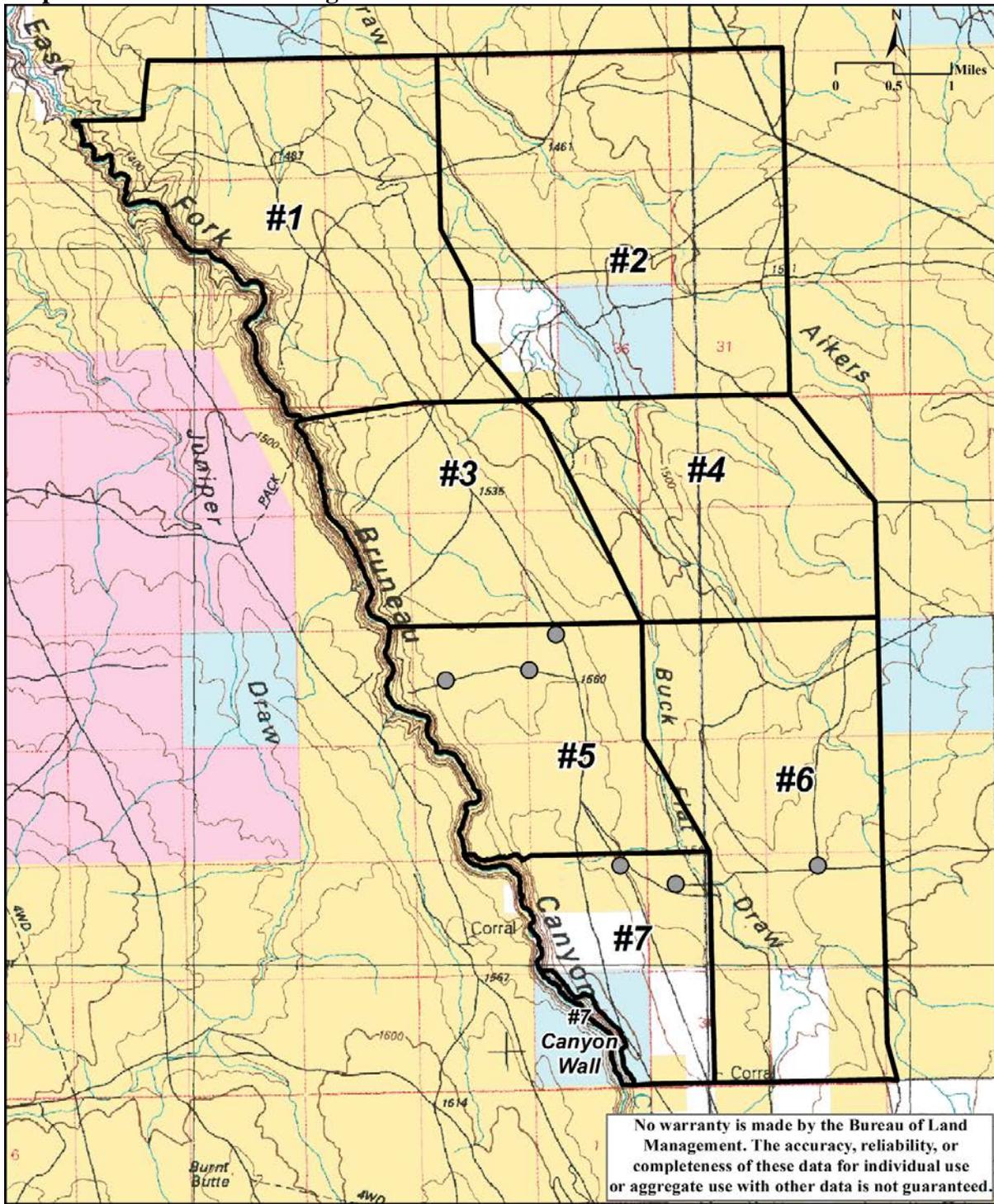
### **Noxious Weeds**

The State of Idaho has listed 65 plant species as noxious weeds. One noxious weed species, diffuse knapweed (*Centaurea diffusa*), is known to occur within the Buck Flat Allotment as of 2014 (Map 5). There are three occurrences in Pasture #5, one occurrence in Pasture #6 and two occurrences in Pasture #7. All these occurrences were chemically treated in 2008.

Treatment goals are to reduce noxious weeds to where they will not have a significant economic or environmental impact and/or to eradicate them completely. The BLM also works to prevent the establishment of new species and infestations in areas where they presently do not occur.

Many of the known noxious weed infestations are found and treated through the Twin Falls District (TFD) Emergency Stabilization and Rehabilitation (ESR) program. Approved ESR plans allow three year funding for weed control and play a vital part in the reestablishment of naturally recovering vegetation, as well as in the successful establishment of newly seeded areas. Weed personnel grid the burned areas and treat noxious weed occurrences in order to allow for reduced competition during reestablishment of desired vegetation. Crews also treat road corridors throughout the field office which helps prevent the spread of weeds from vehicles that may be transporting weed seeds to new areas. Control methods used within the TFD for the treatment of noxious weeds include biological, mechanical, and chemical.

**Map 5: Noxious Weed Management**

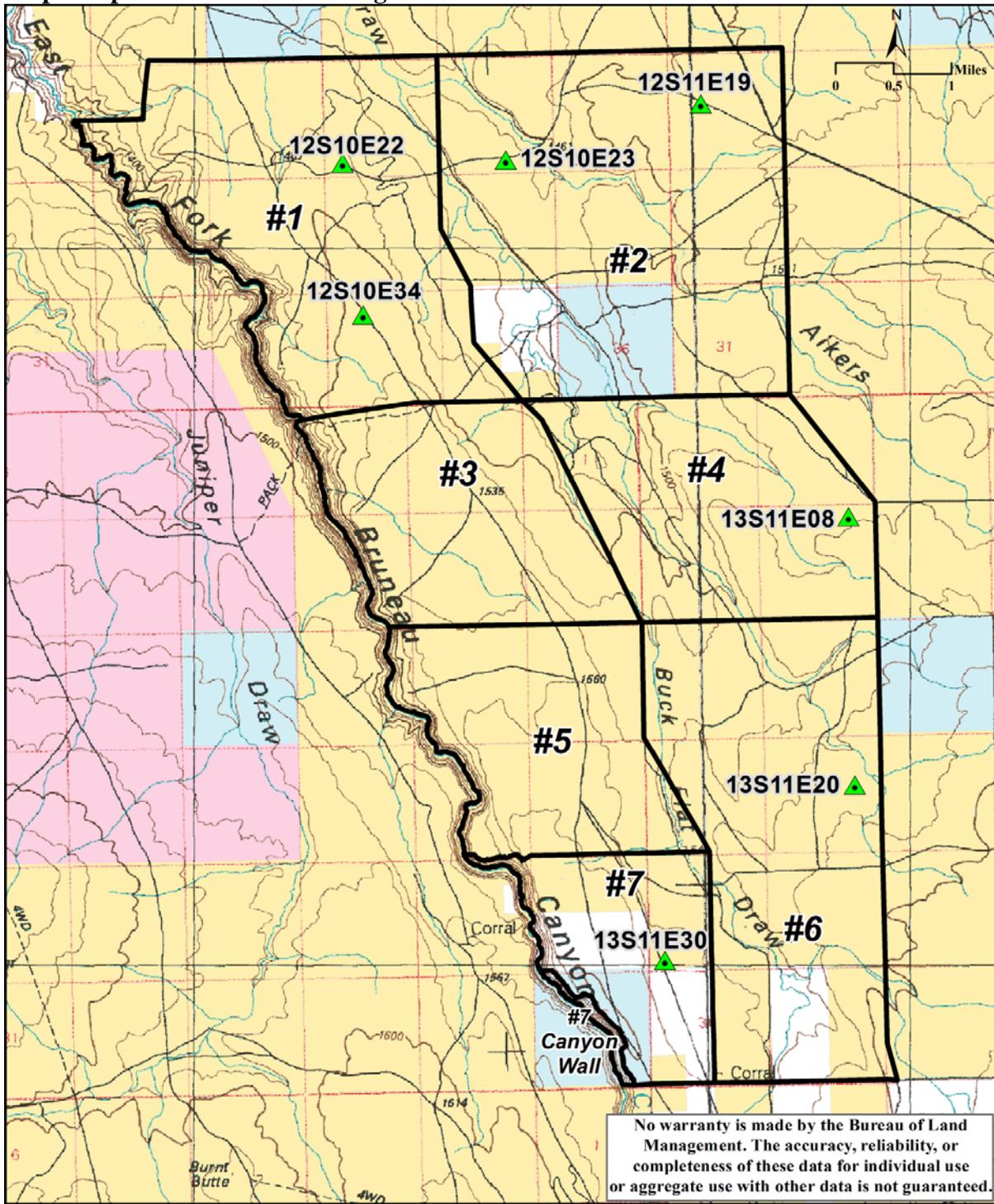


### **Upland Trend Data**

Upland trend monitoring sites have been established in five of the seven pastures within the Buck Flat AMP Allotment (Map 6). Both Nested Frequency and Photo Plot protocols have been used to collect data at the sites (BLM, 1996). Nested frequency records the frequency of plant species at each site while vegetative plant cover is recorded within the photo plots. A total of seven long term trend sites have been established on public land within the allotment. Four of the seven sites have burned by wildfire since 2007 and all four sites have been drill seeded following the fires. A short overview of upland trend monitoring is included below; nevertheless, the effects of fire and subsequent drill seedings on vegetation should be considered when comparisons of current trend data are made to the previously collected trend data. Essentially, the trend data following the fire is the new baseline for future comparisons for each site. Furthermore, tables displaying summarized trend data can be viewed at the JFO.

Factors that limit the comparison of trend data over time include 1) data was not always collected at the same time of the year; 2) not all of the forbs were recorded by genus and species; 3) annual forbs were not always noted; 4) inconsistencies between persons reading the photo plots over the years; and 5) ground cover for shrubs and biological soil crusts were not always recorded when the plots were established.

**Map 6: Upland Trend Monitoring Sites**



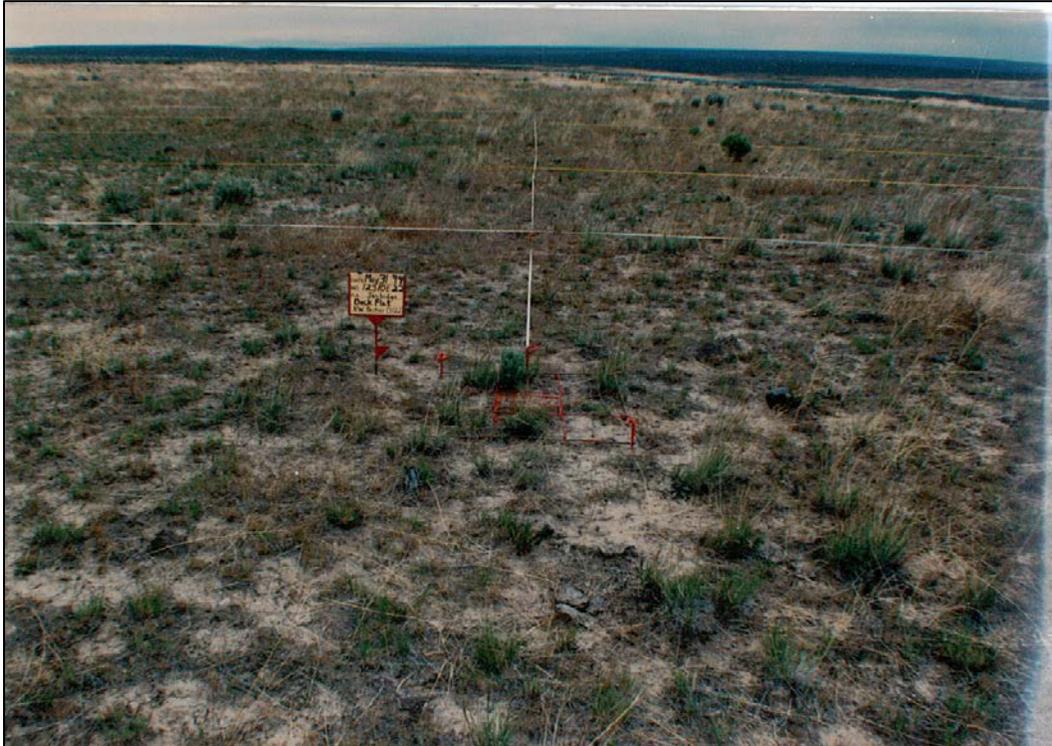
**Pasture #1**

Pasture #1 has two upland trend sites that are Nested Frequency/Photo Plot sites.

**Trend Site 12S10E22:**

Site 12S10E22 (Photo 1) is located within a Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. This site was established and initially read in 1994 and re-read in 2013.

**Photo 1: Overview of Site 12S10E22 dated May 31, 1994**



**Photo 2: Overview of Site 12S10E22 dated June 24, 2013**



**Table 10: Trend Site 12S10E22 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2013
Thurber's needlegrass	4	41	49
Sandberg bluegrass	1	25	41
Cheatgrass	4	41	9
Forbs ( <i>Perennial and Annual</i> )	4	122	323
Wyoming big sagebrush ( <i>Mature</i> )	4	4	8

The key species at this site are Thurber's needlegrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for Thurber's needlegrass and plot 1 for Sandberg bluegrass. The frequency of Thurber's needlegrass has increased from 41 occurrences in 1994 to 49 occurrences in 2013. Frequency of Sandberg bluegrass have also increased from 25 occurrences in 1994 to 41 occurrences in 2013. Cheatgrass decreased from 41 occurrences in 1994 to 9 occurrences in 2013. Wyoming big sagebrush increased from 4 occurrences in 1994 to 8 occurrences in 2013.

The total occurrences of all forbs at the site have increased from 122 in 1994 to 323 in 2013. Six species of perennial forbs were recorded at the site in 2013 and common species included spiny phlox (*Phlox hoodii*), Cusick's penstemon (*Penstemon cusickii*), and longleaf phlox (*Phlox*

*longifolia*). Annual forbs recorded include curvseed butterwort (*Ceratocephala testiculatua*), maiden blue eyed Mary (*Collinsia parviflora*), and slender phlox (*Microsteris gracilis*).

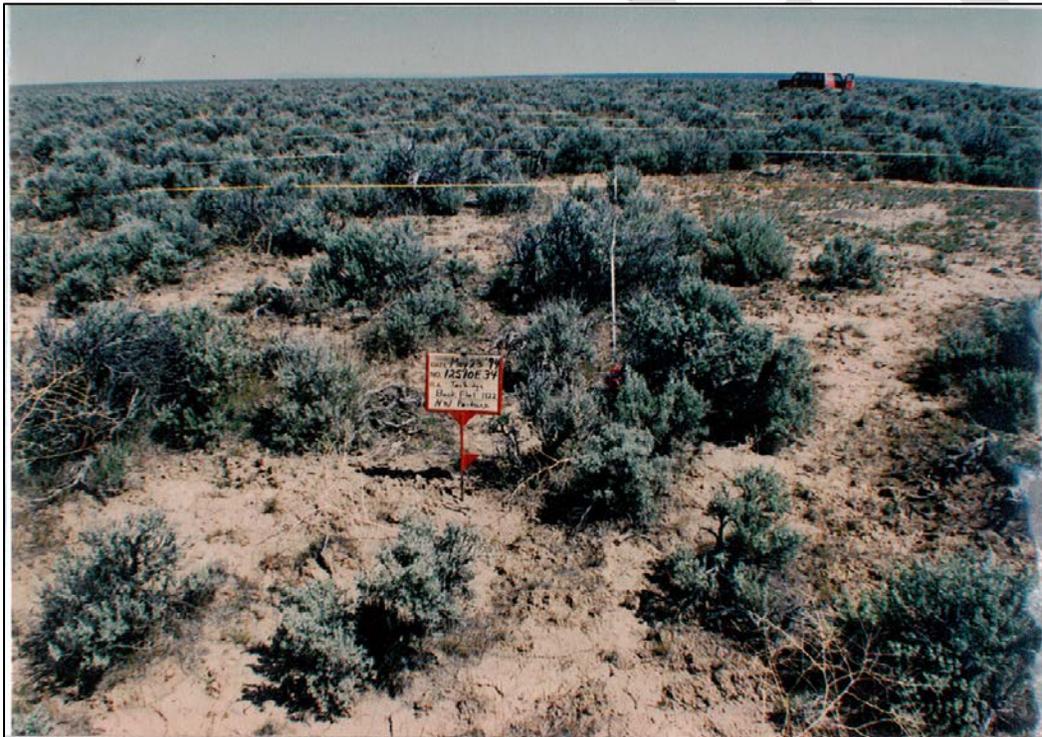
Bare ground has decreased at the site from 43.8 percent in 1994 to 20.5 percent in 2013. Vegetation cover has decreased from 7.3 percent in 1994 to 6.4 percent in 2013. Biological crust was recorded at 42.6 percent in the 2013 data but was not recorded in 1994.

The photo plot at the site shows that from 1994 to 2013, Thurber's needlegrass decreased from 2.9 percent to 2.4 percent and Sandberg bluegrass increased from 2.2 percent to 6.9 percent. Squirreltail was documented at the site in 1994 at 2.0 percent but was not noted in the 2013 data.

Trend Site 12S10E34:

Site 12S10E34 (Photo 2) is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. This site was established and initially read in 1994 and re-read in 2013.

**Photo 3: Overview of Site 12S10E34 dated May 23, 1994**



**Photo 4: Overview of Site 12S10E34 dated June 11, 2013**



**Table 11: Trend Site 12S10E34 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2013
Thurber's needlegrass	4	3	1
Sandberg bluegrass	1	26	56
Bottlebrush Squirreltail	4	55	44
Cheatgrass	4	8	32
Forbs ( <i>Perennial and Annual</i> )	4	122	323
Wyoming big sagebrush ( <i>Mature</i> )	4	41	18

The key species at this site are Thurber's needlegrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for Thurber's needlegrass and plot 1 for Sandberg bluegrass. The frequency of Thurber's needlegrass has decreased from 3 occurrences in 1994 to 1 occurrence in 2013. Occurrences of Sandberg bluegrass have increased from 26 occurrences in 1994 to 56 occurrences in 2013. Occurrences of bottlebrush squirreltail decreased from 55 occurrences in 1994 to 44 occurrences in 2013. Cheatgrass increased from 8 occurrences in 1994 to 32 occurrences in 2013. Wyoming big sagebrush decreased from 41 occurrences in 1994 to 18 occurrences in 2013; a notation in the 1994 field notes stated "there were few sagebrush seedlings present at the site."

The total occurrences of all forbs at the site have increased from 122 in 1994 to 323 in 2013. Nine species of perennial forbs were recorded at the site in 2013 and common species include longleaf phlox, Owyhee milkvetch (*Astragalus atratus owyheensis*), and low pussytoes (*Antennaria dimorpha*). Annual forbs recorded include slender phlox, maiden blue eyed Mary, and curvseed butterwort.

Bare ground has decreased at the site from 48.2 percent in 1994 to 36.2 percent in 2013. Vegetation cover has decreased from 6.0 percent in 1994 to 4.5 percent in 2013. Biological crust was recorded at 30.0 percent in the 2013 data but was not recorded in 1994.

The photo plot at the site shows that from 1994 to 2013, Thurber's needlegrass increased from 0.9 percent to 1.9 percent, Sandberg bluegrass increased from 5.3 percent to 11.2 percent and squirreltail increased from 1.5 percent to 1.6 percent.

### Pasture #2

Pasture #2 has two upland trend sites that are Nested Frequency/Photo Plot sites.

#### Trend Site 12S11E19:

Site 12S11E19 (Photo 2) is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. This site was established and initially read in 1994 and re-read in 2012.

#### **Photo 5: Overview of Site 12S11E19 dated June 9, 1994**



**Photo 6: Overview of Site 12S11E19 dated July 23, 2012**



**Table 12: Trend Site 12S11E19 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2012
Thurber's needlegrass	4	29	20
Sandberg bluegrass	2	78	83
Cheatgrass	4	45	86
Forbs ( <i>Perennial and Annual</i> )	4	109	102
Wyoming big sagebrush ( <i>Mature</i> )	4	37	13

The key specie at this site is Thurber's needlegrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for Thurber's needlegrass. The frequency of Thurber's needlegrass has decreased from 29 occurrences in 1994 to 20 occurrences in 2012. Sandberg bluegrass increased from 78 occurrences in 1994 to 83 occurrences in 2013. Cheatgrass increased from 45 occurrences in 1994 to 86 occurrences in 2012. Wyoming big sagebrush decreased from 37 occurrences in 1994 to 13 occurrences in 2012; a notation in the 1994 field notes stated "there were few sagebrush seedlings present at the site."

The total occurrences of all forbs at the site have decreased from 109 in 1994 to 102 in 2012. Six species of perennial forbs were recorded at the site in 2012 and common species included longleaf phlox, sagebrush phlox (*Phlox aculeata*), and Owyhee milkvetch. Annual forbs

recorded include nodding chickweed (*Cerastium nutans*), maiden blue eyed Mary, and slender phlox.

Bare ground has decreased at the site from 43.0 percent in 1994 to 30.5 percent in 2012. Vegetation cover has increased from 7.2 percent in 1994 to 18.0 percent in 2012. Biological crust was recorded at 12.2 percent in the 2012 data but was not recorded in 1994.

The photo plot data recorded Thurber's needlegrass as 1.0 percent in 1994 but was not documented in 2012. The data also showed that from 1994 to 2012, Sandberg bluegrass increased from 0.7 percent to 7.2 percent, squirreltail decreased from 0.7 percent to 0.1 percent and cheatgrass increased from 0.3 percent to 0.6 percent.

**Trend Site 12S10E23:**

Site 12S10E23 (Photo 4) is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. This site was established and initially read in 1994 and re-read in 2012.

The site burned in the 2013 Horse Butte 2 Fire and was drill seeded with a mix of Anatone bluebunch wheatgrass, Siberian wheatgrass, Sandberg bluegrass, bottlebrush squirreltail, Eski sainfoin, Western yarrow, and Ladak alfalfa.

**Photo 7: Overview of Site 12S10E23 dated May 31, 1994**



**Photo 8: Overview of Site 12S10E23 dated July 23, 2012**



**Table 13: Trend Site 12S10E23 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2012
Thurber's needlegrass	4	19	21
Western wheatgrass	1	25	8
Sandberg bluegrass	2	71	99
Cheatgrass	2	72	33
Forbs ( <i>Perennial and Annual</i> )	4	113	139
Wyoming big sagebrush ( <i>Mature</i> )	4	34	36

The key species at this site are Thurber's needlegrass and western wheatgrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for Thurber's needlegrass and plot 1 for western wheatgrass. The frequency of Thurber's needlegrass has increased from 19 occurrences in 1994 to 21 occurrences in 2012. Occurrences of western wheatgrass have decreased from 25 occurrences in 1994 to 8 occurrences in 2012. Sandberg bluegrass increased from 71 occurrences in 1994 to 99 occurrences in 2013. Cheatgrass decreased from 72 occurrences in 1994 to 33 occurrences in 2012. Wyoming big sagebrush increased from 34 occurrences in 1994 to 36 occurrences in 2012.

The total occurrences of all forbs at the site have increased from 113 in 1994 to 139 in 2012. Three species of perennial forbs were recorded at the site in 2012 and common species included

longleaf phlox and sagebrush phlox. Annual forbs recorded included nodding chickweed and curvseed butterwort.

Bare ground has decreased at the site from 39.7 percent in 1994 to 25.2 percent in 2012. Vegetation cover has increased from 7.0 percent in 1994 to 13.2 percent in 2012. Biological crust was recorded at 21.5 percent in the 2012 data but was not recorded in 1994.

The photo plot at the site shows that from 1994 to 2013, Thurber's needlegrass increased from 0.6 percent to 1.5 percent and western wheatgrass remained static at 0.6 percent. Squirreltail increased from 0.5 percent to 0.7 percent and Sandberg bluegrass decreased from 4.6 percent to 2.9 percent.

#### **Pasture #4**

Pasture #4 has one upland trend site that is a Nested Frequency/Photo Plot site.

#### **Trend Site 13S11E08:**

Site 13S11E08 (Photo 5) is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. This site was established and initially read in 1994 and re-read in 2012. The site burned in the 2007 Murphy Complex Fire and was subsequently aerielly seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2012 data to the original 1994 would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2012 trend reading is discussed below only to show the general recovery and current baseline of the site.

#### **Photo 9: Overview of Site 13S11E08 dated June 7, 1994**



**Photo 10: Overview of Site 13S11E08 dated July 25, 2012**



**Table 14: Trend Site 13S11E08 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2012
Bluebunch wheatgrass	4	13	21
Sandberg bluegrass	1	21	40
Bottlebrush Squirreltail	2	55	12
Cheatgrass	3	51	75
Forbs ( <i>Perennial and Annual</i> )	4	108	250
Wyoming big sagebrush ( <i>Mature</i> )	4	12	0

The key species at this site are bluebunch wheatgrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for bluebunch wheatgrass and plot 1 for Sandberg bluegrass. The frequency of bluebunch wheatgrass has increased from 13 occurrences in 1994 to 21 occurrence in 2012. Occurrences of Sandberg bluegrass increased from 21 occurrences in 1994 to 40 occurrences in 2012. Bottlebrush Squirreltail decreased from 55 occurrences in 1994 to 12 occurrences in 2012. Cheatgrass increased from 55 occurrences in 1994 to 77 occurrences in 2012. Wyoming big sagebrush decreased from 12 occurrences in 1994 to 0 occurrences in 2012.

The total occurrences of all forbs at the site have increased from 108 in 1994 to 250 in 2012. Five species of perennial forbs were recorded at the site in 2012 and common species included

longleaf phlox, spiny phlox and false agoseris (*Agoseris glauca*). Annual forbs recorded included nodding chickweed, yellow salsify (*Tragopogon dubius*) and tall annual willowherb (*Epilobium brachycarpum*).

Bare ground has decreased at the site from 35.0 percent in 1994 to 8.5 percent in 2012. Vegetation cover has increased from 7.7 percent in 1994 to 14.0 percent in 2012. Biological crust was recorded at 6.0 percent in the 2012 data but was not recorded in 1994.

The photo plot at the site shows that from 1994 to 2012, bluebunch wheatgrass increased from 2.2 percent to 2.5 percent and Sandberg bluegrass increased from 6.4 percent to 9.1 percent. Squirreltail increased from 2.2 percent to 6.5 percent.

### **Pasture #6**

Pasture #6 has one upland trend site that is a Nested Frequency/Photo Plot site.

#### **Trend Site 13S11E20:**

Site 13S11E20 (Photo 6) is located within the Loamy 10-13" Wyoming big sagebrush/bluebunch wheatgrass (R025XY019ID) ecological site. This site was established and initially read in 1994 and re-read in 2013. This site burned in the 2007 Murphy Complex and was subsequently aeriually seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2013 data to the original 1994 would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2013 trend reading is discussed below only to show the general recovery and current baseline of the site.

**Photo 11: Overview of Site 13S11E20 dated June 2, 1994**



**Photo 12: Overview of Site 13S11E20 dated June 17, 2013**



**Table 15: Trend Site 13S11E20 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1994	2013
Bluebunch wheatgrass	4	36	39
Sandberg bluegrass	1	19	35
Bottlebrush Squirreltail	2	45	9
Cheatgrass	4	59	45
Forbs ( <i>Perennial and Annual</i> )	4	77	426
Wyoming big sagebrush ( <i>Mature</i> )	4	8	0

The key species at this site are bluebunch wheatgrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 4 within the nested frequency frame for bluebunch wheatgrass and plot 1 for Sandberg bluegrass. The frequency of bluebunch wheatgrass has increased from 36 occurrences in 1994 to 39 occurrence in 2013. Occurrences of Sandberg bluegrass have increased from 19 occurrences in 1994 to 35 occurrences in 2013. Bottlebrush Squirreltail decreased from 45 occurrences in 1994 to 9 occurrences in 2013. Cheatgrass decreased from 59 occurrences in 1994 to 45 occurrences in 2013. Wyoming big sagebrush decreased from 8 occurrences in 1994 to 0 occurrences in 2012.

The total occurrences of all forbs at the site have increased from 77 in 1994 to 426 in 2013. Eight species of perennial forbs were recorded at the site in 2013 and common species included longleaf phlox, false agoseris and sagebrush phlox. Annual forbs recorded included slender phlox, maiden blue eyed Mary and clasping pepperweed (*Lepidium perfoliatum*).

Bare ground has decreased at the site from 44.5 percent in 1994 to 31.7 percent in 2013. Vegetation cover has increased from 9.5 percent in 1994 to 17.2 percent in 2013. Biological crust was recorded at 9.5 percent in the 2012 data but was not recorded in 1994.

The photo plot at the site shows that from 1994 to 2013, bluebunch wheatgrass increased from 6.3 percent to 17.6 percent and Sandberg bluegrass decreased from 5.2 percent to 4.3 percent. Squirreltail was recorded in 1994 at 1.0 percent but wasn't recorded in 2013.

**Pasture #7**

Pasture #7 has one upland trend site that is a Nested Frequency/Photo Plot site.

**Trend Site 13S11E30:**

Site 13S11E30 (Photo 7) is located within the Loamy 10-13" Wyoming big sagebrush/bluebunch wheatgrass (R025XY019ID) ecological site. This site was established and initially read in 1993 and re-read in 2013. This site burned in the 2007 Murphy Complex and was subsequently aerially seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2013 data to the original 1993 would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2013 trend reading is discussed below only to show the general recovery and current baseline of the site.

**Photo 13: Overview of Site 13S11E30 dated August 17, 1993**



**Photo 14: Overview of Site 13S11E30 dated June 19, 2013**



**Table 16: Trend Site 13S11E30 Nested Frequency Data Summary**

Species or Vegetation Class	Plot	Occurrences	
		1993	2013
Bluebunch wheatgrass	2	50	41
Sandberg bluegrass	1	35	40
Cheatgrass	4	0	5
Forbs ( <i>Perennial and Annual</i> )	4	35	40
Wyoming big sagebrush ( <i>Mature</i> )	4	17	0

The key species at this site are bluebunch wheatgrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 2 within the nested frequency frame for bluebunch wheatgrass and plot 1 for Sandberg bluegrass. The frequency of bluebunch wheatgrass has decreased from 50 occurrences in 1993 to 35 occurrence in 2013. Occurrences of Sandberg bluegrass have increased from 35 occurrences in 1993 to 40 occurrences in 2013. Cheatgrass increased from 0 occurrences in 1993 to 5 occurrences in 2013. Wyoming big sagebrush decreased from 17 occurrences in 1994 to 0 occurrences in 2013.

The total occurrences of all forbs at the site have increased from 136 in 1993 to 468 in 2013. Eight species of perennial forbs were recorded at the site in 2013 and common species included longleaf phlox, sagebrush phlox and false agoseris. Annual forbs recorded included slender phlox, maiden blue eyed Mary, and spring draba (*Draba verna*).

Bare ground has decreased at the site from 42.5 percent in 1993 to 32.5 percent in 2013. Vegetation cover has increased from 8.7 percent in 1993 to 11.7 percent in 2013. Biological crust was recorded at 14.7 percent in the 2013 data but was not recorded in 1994.

The photo plot at the site shows that from 1993 to 2013, bluebunch wheatgrass decreased from 3.1 percent to 1.6 percent and Sandberg bluegrass increased from 4.5 percent to 7.2 percent. Squirreltail was recorded in 1993 at 0.8 percent but wasn't recorded in 2013.

## **IDAHO RANGELAND HEALTH STANDARDS ASSESSMENT**

There are eight standards for healthy rangelands that apply to BLM lands in the state of Idaho. Not all of the Standards apply to the Buck Flat AMP Allotment due to variances in the land type and geographical area. Of the eight Idaho Standards for Rangeland Health, the following six standards are applicable to the Buck Flat AMP Allotment:

- **Standard 1** – Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, hydrologic cycling, and energy flow.
- **Standard 2** – Riparian-wetland areas are in properly functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

- **Standard 3** – Stream channels and floodplains are properly functioning relative to the geomorphology (e.g. gradient, size, shape, roughness, confinement, and sinuosity) and climate to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
- **Standard 4** – Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.
- **Standard 7** – Surface and ground water on public lands comply with the Idaho Water Quality Standards.
- **Standard 8** – Habitats are suitable to maintain viable populations of threatened, endangered, sensitive, and other special status species.

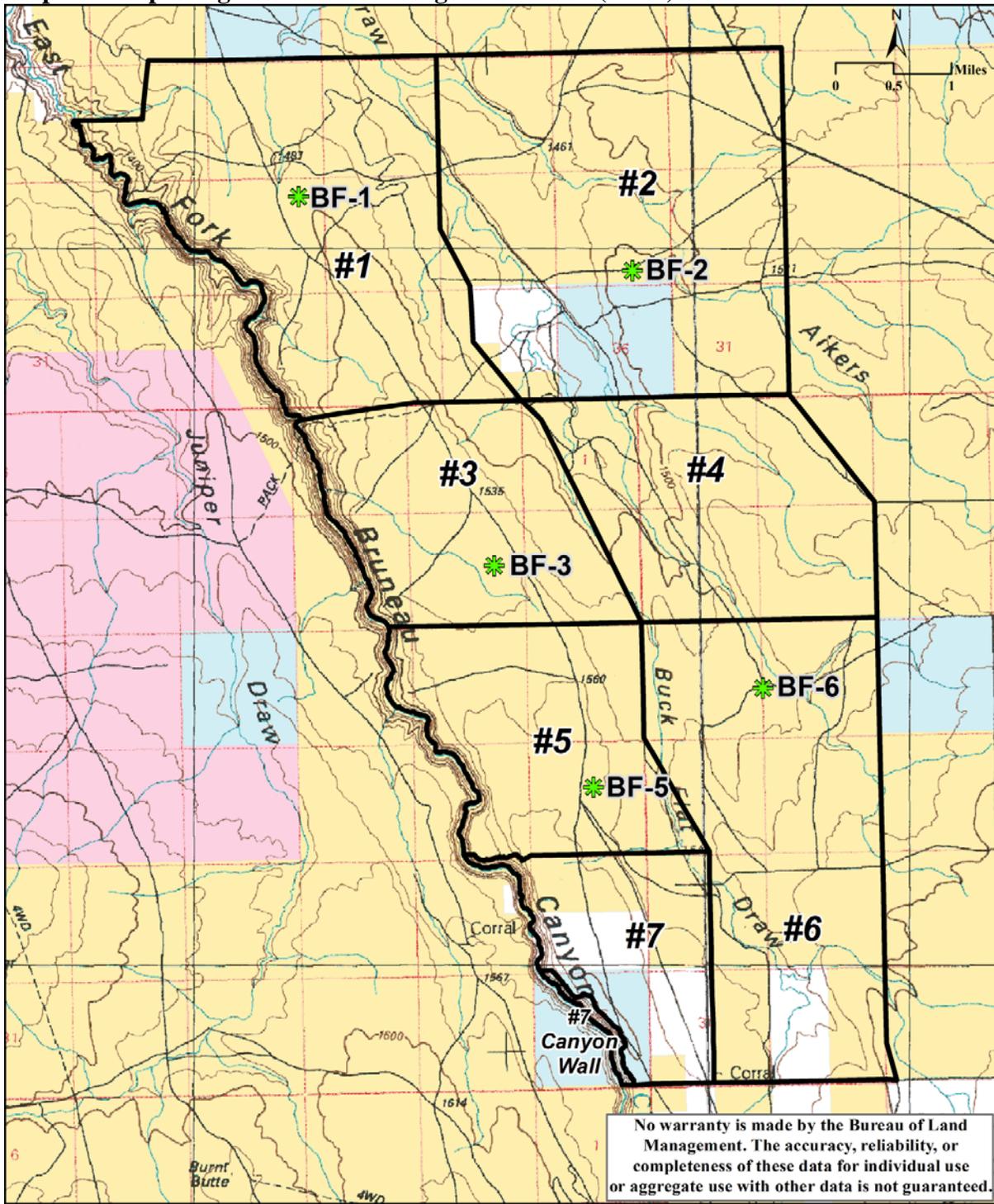
*\*Standards 5 and 6 do not apply to the Buck Flat AMP Allotment*

**Table 17: Standards Applicable to the Buck Flat AMP Allotment by Pasture.**

<b>Standard</b>	<b>Pastures</b>
1	All Pastures
2	Pastures #1, #3, #5, and #7
3	Pastures #1, #3, #5, and #7
4	All Pastures
5	Not applicable
6	Not applicable
7	Pastures #1, #3, #5 and #7
8	All Pastures

An interdisciplinary (ID) team conducted IIRH field evaluations at five sites representative of the Buck Flat AMP Allotment during June, 2013. The sites were located in Pastures #1, #2, #3, #5, and #6 (Map 7). The sites were located in areas of native plant communities. Of the five sites at which IIRH evaluations were conducted, three sites were HAF sites and two sites were randomly selected by the ID team as being representative of the vegetation community within the area.

**Map 7: Interpreting Indicators of Rangeland Health (IIRH) Sites**



HAF sites were randomly generated through a GIS process (Appendix A). Key utilization sites were selected in representative areas based on the presence of key forage species, distance from livestock water, and accessibility of the area to livestock grazing. When the ID team conducted IIRH field evaluations, the HAF sites were visited first. If the ID team determined the HAF site(s) was not representative of the vegetation community, an ESI site was then selected if available within that vegetation community. If no ESI site was available, a key utilization site was used. When the ID team determined that none of the pre-determined sites were representative of the vegetation community, a new location was selected that was representative of the vegetation community.

Indicators of rangeland health (Table 18) were used to evaluate three rangeland health attributes (Table 19): Soil and Site Stability, Hydrologic Function, and Biotic Integrity (Pellant et al., 2005). The IIRH evaluation sheet was completed at each site, photographs were taken, and a list of plant species observed was recorded. In addition, general field notes were recorded for the allotment that included such items as presence of noxious weeds, wildlife sign, recreation impacts, and presence or condition of range infrastructure.

Cover transects to determine vegetative cover were recorded at three of the five following the line point intercept method as described in the Sage-grouse Habitat Assessment Framework (Stiver et al., 2010) protocol. Because forbs are important to sage-grouse, the line point intercept method was augmented using Daubenmire frames. Forb species were recorded in 7.9 inch by 19.7 inch (20 cm by 50 cm) Daubenmire frame placed at each point along the line intercept. This resulted in more comprehensive data on forb species diversity present than could be obtained by the line point intercept alone.

In addition to evaluating rangeland health indicators at each of the randomly selected sites, the ID team examined other areas of the pastures to ensure evaluation sites were representative of the pasture and vegetation community. Vegetation data collected at evaluation sites were compared to the Natural Resource Conservation Service's (NRCS) ecological site description (ESD) reference sheet for the soil type and potential vegetation in the Buck Flat AMP Allotment. The ESD reference sheets describe the expected condition of the ecological site in reference state. The site within Pasture #5 occurred in the Loamy 10-13" Wyoming big sagebrush/bluebunch wheatgrass ecological site (R025XY019ID, USDA and NRCS, 2013a). The sites in Pastures #1, #2, #3, and #6 occurred in the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass ecological site (R011XY001ID, USDA and NRCS, 2013b). The ESD reference sheets describe the expected condition of both the ecological sites in state 1, phase A of the reference state. This plant community should have Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) in the overstory with bluebunch wheatgrass dominating the understory. Thurber's needlegrass, Sandberg bluegrass, bottlebrush squirreltail and arrowleaf balsamroot (*Balsamorhiza sagittata*) should be sub-dominant species. Other significant species in the plant community can include Indian ricegrass (*Achnatherum hymenoides*), foxtail wheatgrass (*Pseudelymus saxicola*), Idaho fescue (*Festuca idahoensis*), longleaf and spiny phlox, and yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Natural fire frequency should be 50-70 years.

Indicator ratings for each site in the Buck Flat AMP Allotment are shown in Table 18 and rangeland health attributes ratings are shown in Table 19.

**Table 18: Summary of 17 Rangeland Health Indicators**

Indicators	Attributes S = Soil & Site Stability H=Hydrologic Function B = Biotic Integrity	Degree of Departure from Reference Condition				
		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills	S, H					BF1, BF2, BF3, BF5, BF6
2. Water-flow Patterns	S, H					BF1, BF2, BF3, BF5, BF6
3. Pedestals and/or terracettes	S, H				BF5	BF1, BF2, BF3, BF6
4. Bare ground	S, H					BF1, BF2, BF3, BF5, BF6
5. Gullies	S, H					BF1, BF2, BF3, BF5, BF6
6. Wind-scoured, blowouts, and/or deposition areas	S					BF1, BF2, BF3, BF5, BF6
7. Litter movement	S					BF1, BF2, BF3, BF5, BF6
8. Soil surface resistance to erosion	S, H, B					BF1, BF2, BF3, BF5, BF6
9. Soil surface loss or degradation	S, H, B				BF5, BF6	BF1, BF2, BF3
10. Plant community composition and distribution relative to infiltration	H			BF5	BF6	BF1, BF2, BF3
11. Compaction layer	S, H, B					BF1, BF2, BF3, BF5, BF6
12. Functional/structural groups	B				BF1, BF5, BF6	BF2, BF3
13. Plant mortality/decadence	B					BF1, BF2, BF3, BF5, BF6

Indicators	Attributes S = Soil & Site Stability H=Hydrologic Function B = Biotic Integrity	Degree of Departure from Reference Condition				
		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
14. Litter amount	H, B			BF1, BF2, BF5	BF3, BF6	
15. Annual production	B					BF1, BF2, BF3, BF5, BF6
16. Invasive plants	B		BF1, BF5	BF2	BF6	BF3
17. Reproductive capability of perennial plants	B					BF1, BF2, BF3, BF5, BF6

BF1-Pasture #1; BF2-Pasture #2; BF3-Pasture #3; BF5-Pasture #5; BF6-Pasture# 6

The ratings of the 17 indicators do not result in a single rating of rangeland health for a site. The 17 indicators are related to three components of rangeland health known as attributes (soil and site stability, hydrologic function, and biotic integrity). The second column of Table 18 identifies which indicators are related to each of the three attributes. The ID team arrived at attribute departure ratings by considering the preponderance of evidence of departure for the group of indicators related to each attribute. Indicators showing departure from reference conditions may be weighted more heavily, based upon the effect of the departure on ecological function of the site being evaluated. The degree of departure ratings for each of the three attributes of rangeland health are shown in Table 19.

**Table 19: Rangeland Health Attribute Rating by Site**

Rangeland Health Attribute	Degree of Departure				
	Extreme to Total	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil and Site Stability				BF5	BF1, BF2, BF3, BF6
Hydrologic Function				BF5, BF6	BF1, BF2, BF3
Biotic Integrity			BF1, BF5	BF2, BF6	BF3

BF1-Pasture #1; BF2-Pasture #2; BF3-Pasture #3; BF5-Pasture #5; BF6-Pasture #6

### **Standard 1 (Watersheds)**

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

### **Rangeland Health Assessment**

One site (BF5) was evaluated with the reference sheet for the Loamy 10-13” Wyoming big sagebrush/bluebunch wheatgrass ESD, and four sites (BF1, BF2, BF3, and BF6) were evaluated with the reference sheet for the Loamy 8-12” Wyoming big sagebrush/bluebunch wheatgrass/Thurber’s needlegrass ESD.

The reference sheets for the Loamy 8-12” and Loamy 10-13” ESDs indicate bare ground should range from 30-40 percent, litter cover should range from 5-10 percent, and soil stability test values should range from 4-6 (Scale of 1 to 6; Pellant et al., 2005).

Litter percentage calculations used for rating indicator 14 include all litter, detached and standing. While the ESD indicates that litter cover should range from 5-10 percent, ESI and HAF data collected within the allotment show that litter values actually range from approximately 4-26 percent cover. With this, even though the litter indicator may have been rated as a departure from the reference condition, this departure may not be reflected in the overall attribute rating. Average percent bare ground recorded in the 2006 ESI data and the 2013 HAF data ranges from 7-42 percent cover. In addition, soil stability tests (Pellant et al., 2005) were completed within Pastures #2 and #5, as representative of the soils in the allotment, and resulted in an average soil stability value of 5.7 and 4.7, respectively; indicating adequate soil surface resistance to erosion. The soil profile within Pasture #2 and Pasture #5 are shown in Photos 15 and 16.

**Photo 15: Soil Profile in Pasture #2 at IIRH site BF2**



**Photo 16: Soil Profile in Pasture #5 at IIRH site BF5**



Multiple soil series exist within the Buck Flat AMP Allotment and are typically silt loams. The majority of the allotment is relatively flat, with the exceptions of Clover Creek along the western border, Buck Flat Draw running north to south through the center of the allotment, and Aiker Draw running from northwest to southeast in Pasture #2. The Soil Survey Geographic (SSURGO) Database (NRCS 2012) shows that 3 percent of the allotment has a severe wind erosion hazard, 73 percent has a moderate wind erosion hazard, 19 percent has a slight erosion hazard, <1 percent has a non-erosional wind erosion hazard, and 4 percent has no data on wind erosion. In addition, the soil survey shows that 51 percent of the allotment has a high water erosion hazard, 44 percent has a medium water erosion hazard, <1 percent has a low water erosion hazard, and 4 percent has no data for water erosion.

Although the soil survey shows potential for both wind and water erosion in this area, no indications of soil loss or active erosion were noted at three of the five sites during the 2013 IIRH field visit. At site BF5, plant pedestals and/or terracettes were observed but they did not appear to be active and site BF6 had experienced soil surface loss or degradation which was indicated by a reduced soil organic layer. This most likely occurred during the 2007 Murphy Complex Fire. Abundant perennial vegetation, as well as some biological soil crusts, is present to provide protection for site stability throughout the majority of the allotment (Table 20 and Tables 26 - 28).

Litter cover is generally higher at the sites than expected; however, litter is providing ground cover for site protection and is replenishing nutrients. Moreover, the higher amounts of litter at the sites do not appear to be negatively affecting ecological processes.

**Table 20: Percent ground cover (top layer) at IIRH sites**

Ground Cover	IIRH Site BF1	IIRH Site BF2	IIRH Site BF3	IIRH Site BF5	IIRH Site BF6
	Pasture #1	Pasture #2	Pasture #3	Pasture #5	Pasture #6
Perennial Grasses	28%	20%	20%	23%	33%
Annual Grasses	0%	5%	0%	6%	4%
Perennial Forbs	1%	0%	1%	8%	4%
Annual Forbs	0%	1%	4%	5%	10%
Shrubs	34%	21%	26%	1%	1%
Biological Soil Crust	3%	20%	13%	4%	23%
Bare Ground	25%	18%	19%	27%	11%
Litter	7%	15%	19%	26%	14%
Rock	1%	0%	0%	0%	0%

**Pasture #1****IIRH Site BF1 (Loamy 8-12")**

Site BF1 is located in a native vegetation community where Sandberg bluegrass is the dominant grass species (25% cover) and yellow rabbitbrush is the dominant shrub species (18% cover). In addition, biological soil crusts comprise 3 percent of the cover (Table 20). The site is of relatively flat topography with a north aspect. The site last burned in the 1973 Clover Flat Fire and was not reseeded following the fire.

The indicator for litter amount was rated as a moderate departure from the reference condition due to an increase in the amount of litter (35% cover for all layers) found at the site.

All other indicators related to the Soil and Site Stability and Hydrologic Function were rated as none to slight departure from the reference condition. Therefore, the Soil and Site Stability and Hydrologic Function attributes were each rated as a none to slight departure.

**Pasture #2****IIRH Site BF2 (Loamy 8-12")**

Site BF2 is located in a Wyoming big sagebrush/Sandberg bluegrass vegetation community where Sandberg bluegrass is the dominant grass species (13% cover) and Wyoming big sagebrush is the dominant shrub species (21% cover). In addition, biological soil crusts comprise 20 percent of the cover (Table 20). The site is of relatively flat topography with a north aspect. The site has not been burned by wildfire in over 50 years.

The indicator for litter amount was rated as a moderate departure from the reference condition due to an increase in the amount of litter (31% cover for all layers) found at the site. A soil stability test (Pellant et al., 2005) was completed at the site and the soil stability value averaged 5.7 indicating adequate soil surface resistance to erosion.

All other indicators related to the Soil and Site Stability and Hydrologic Function were rated as none to slight departure from the reference condition. Therefore, the Soil and Site Stability and Hydrologic Function attributes were each rated as a none to slight departure.

### **Pastures #3 and #4**

#### **IIRH Site BF3 (Loamy 8-12")**

Site BF3 is located in Pasture #3, but is also representative of Pasture #4, and is located in a Wyoming big sagebrush/Sandberg bluegrass vegetation community where Sandberg bluegrass is the dominant grass species (18% cover) and Wyoming big sagebrush is the dominant shrub species (26% cover). In addition, biological soil crusts comprise 13 percent of the cover (Table 20). The site is of relatively flat topography with a north aspect. The site last burned in the 1973 Clover Flat Fire and was not reseeded following the fire.

The indicator for litter amount was rated as a slight to moderate departure from the reference condition due to the increase in the amount of litter (21% cover for all layers) found at the site.

All other indicators related to the Soil and Site Stability and Hydrologic Function were rated as none to slight departure from the reference condition. Therefore, the Soil and Site Stability and Hydrologic Function attributes were each rated as a none to slight departure.

### **Pastures #5 and #7**

#### **IIRH Site BF5 (Loamy 10-13")**

Site BF5 is located in Pasture #5, but is also representative of Pasture #7, and is located in a native vegetation community where Sandberg bluegrass is the dominant grass species (18% cover) and rubber rabbitbrush (*Ericameria nauseosa*) was present at 1 percent cover. In addition, biological soil crusts comprise 4 percent cover (Table 20). The site is of relatively flat topography with a north aspect. The site burned in the 1973 Clover Flat Fire and again in the 2007 Murphy Complex Fires. The site has not been drill seeded but Wyoming big sagebrush was aerially seeded in strips in 2008. Sagebrush is establishing within the aerially seeded strips.

The indicators for pedestals and/or terracettes and soil surface loss or degradation were rated as a slight to moderate departure due to the evidence of past soil loss as expressed by terracettes being present. The site appeared stable and there were no signs of active erosion.

The indicator for plant community composition and distribution relative to infiltration was rated as a moderate departure from the reference condition due to the low abundance of shrubs at the site. In the photos at the site, Wyoming big sagebrush seedlings are present but they occur at low density.

The indicator for litter amount was rated as a moderate departure from the reference condition due to a moderate increase in the amount of litter (38% cover for all layers) found at the site. A soil stability test (Pellant et al., 2005) was completed at the site and the soil stability value averaged 4.7 indicating adequate soil surface resistance to erosion.

All other indicators related to the Soil and Site Stability and Hydrologic Function were rated as none to slight departure from the reference condition. Due to the departure from reference condition on pedestals and/or terracettes, soil surface loss or degradation, plant community composition and distribution relative to infiltration, and litter amount indicators the Soil and Site Stability and Hydrologic Function attributes were each rated as a slight to moderate departure.

### **Pasture #6**

#### **IIRH Site BF6 (Loamy 8-12")**

Site BF6 is located in a native vegetation community with Sandberg bluegrass (22% cover), bottlebrush squirreltail (9% cover), bluebunch wheatgrass (1% cover), and Thurber's needgrass (1% cover). Wyoming big sagebrush has been reduced by fires but is present (1% cover) and showing signs of reproduction and recruitment. The site is of relatively flat topography with a north aspect. The entire pasture burned in the 1973 Horse Butte Fire and again in the 2007 Murphy Complex Fire. The site has not been drill seeded but Wyoming big sagebrush was aerially seeded in strips in 2008. Sagebrush is establishing within the aerially seeded strips.

The indicator for soil surface loss or degradation was rated as a slight to moderate departure due to evidence of past soil loss as expressed by a reduced organic layer in the soil profile. This likely occurred after the 2007 Murphy Complex Fire. While the soil organic layer appeared thinner than what was observed in other pastures of the allotment the soil A horizon was intact. The site appeared stable and there were no signs of active erosion.

The indicator for plant community composition and distribution relative to infiltration was rated as a slight to moderate departure from the reference condition due to the reduced shrub component at the site.

The indicator for litter amount was rated as a slight to moderate departure from the reference condition due to an increase in the amount of litter (42% cover for all layers) found at the site.

All other indicators related to the Soil and Site Stability and Hydrologic Function were rated as none to slight departure from the reference condition. Due to the departure from reference condition on pedestals and/or terracettes, soil surface loss or degradation, plant community composition and distribution relative to infiltration, and litter amount indicators the Soil and Site Stability and Hydrologic Function attributes were each rated as a slight to moderate departure.

#### **Allotment Summary for Standard 1 (Watersheds)**

Attributes of rangeland health related to Standard 1 (Soil and Site Stability and Hydrologic Function) were determined to have none to slight departure at the three sites (BF1, BF2, BF3). At one site (BF5) the rangeland health attributes related to Standard 1 (Soil and Site Stability and Hydrologic Function) were determined to have a slight to moderate departure. At one site (BF6) the rangeland health attributes related to soil and site stability was determined to have a none to slight departure and the hydrologic function attribute was determined to have slight to moderate departure.

### **Evaluation of Standard 1**

There were some signs of soil surface loss or degradation and pedestals and/or terracettes at sites BF5 and BF6. The soil loss and pedestals were observed at sites that burned in the 2007 Murphy Complex Fire. The appearance of pedestals and a reduced soil organic layer suggests some soil loss has occurred. While pedestals and a reduced soil organic layer is a concern, other indicators of accelerated erosion such as gullies, rills, or water flow patterns were not present in the allotment.

The plant community composition and distribution relative to infiltration indicator at one site was rated as a slight to moderate departure (BF6) and moderate at another (BF5) due to a reduction of shrubs. Shrubs are important to range sites as they trap snow which can increase infiltration. While sagebrush cover has been reduced throughout the pasture, perennial grass species appeared vigorous and were producing seed heads at the site, suggesting that the reduction of shrub cover is not negatively affecting infiltration to the point of reducing perennial grass vigor or reproductive capability.

The amount of litter found within the allotment is higher than what is described in the ESD. However, the ID team determined that the amount of litter was appropriate for site stability and ecological processes as shown by adequate soil moisture, as well as annual plant production matching what is expected.

#### **Evaluation Finding – Allotment is:**

- Meeting the Standard
- Not meeting the Standard, but making significant progress towards meeting
- Not meeting the Standard

#### **Rationale for Evaluation Finding**

Within unburned areas in the Buck Flat AMP Allotment, abundant perennial vegetation, as well as biological soil crusts, are present to provide protection for site stability. Topography is relatively flat, reducing the risk for accelerated soil erosion.

Observations made by the ID team during 2013 Rangeland Health Assessment (RHA) efforts, as well as cover data (ESI and HAF data, Table 20 and Tables 26 – 28) collected within the Buck Flat AMP Allotment indicate that ground cover (vegetation, biological soil crusts, litter, etc.) is sufficient for soil stability.

Within the 2007 burned area, biological soil crusts are generally of lower abundance than in unburned areas; however, adequate vegetation and litter are present in these areas to protect the soil surface from erosion. Deep-rooted perennial bunchgrasses are of lower abundance than is expected in most areas of the allotment, which has the potential to affect infiltration and retention of soil moisture. However, an adequate amount of deep-rooted perennial bunchgrasses, as well as some shrub species, are present in most areas of the allotment to carry soil moisture deeper in the soil profile.

The appearance of pedestals and a reduced soil organic layer suggests some soil loss has occurred. Soil loss and pedestals were observed at sites that burned in the 2007 Murphy Complex

Fire. Evidence of other indicators of accelerated erosion such as gullies, rills, or water flow patterns were not present within the allotment. Infiltration, retention, and release of water processes relative to soil, vegetation, climate and landform appear to be providing for appropriate nutrient and hydrologic cycling and energy flow.

The litter amount indicator ratings deviated from the ESD reference condition at all of the five sites. However, the ID team determined the litter amount was appropriate for site stability and ecological processes as shown by adequate soil moisture, as well as plant growth/annual production matching what is expected at each site.

Overall, upland trend data within the allotment show that bare ground has decreased over time. In addition, cover of live vegetation has increased at five of the seven upland trend sites within the allotment and decreased only slightly at the other two sites. While it appears that biological soil crusts were not recorded 1994, the most recent data (2012 and 2013) show biological soil crusts to comprise a substantial amount of cover within most areas of the allotment.

### **Standard 2 (Riparian Areas & Wetlands)**

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

### **Pastures #2, #4, and #6:**

X Standard Doesn't Apply

All streams within Pastures #2, #4, and #6 of the Buck Flat AMP Allotment are classified as ephemeral (USGS 2014; National Hydrography Dataset). Ephemeral streams only flow in direct response to precipitation and are above the water table throughout the year (BLM 1998). Riparian vegetation, springs, or wetlands are not present within the pastures. Therefore, Standard 2 does not apply to Pastures #2, #4, and #6 of the Buck Flat AMP Allotment.

### **Pastures #1, #3, #5, and #7:**

#### **Rangeland Health Assessment**

Clover Creek is the only perennial stream within the Buck Flat AMP Allotment. Clover Creek forms the western boundary of the allotment and separates the Buck Flat AMP Allotment from the Juniper Ranch, Juniper Draw, and Juniper Butte Allotments. Approximately 10.2 miles of Clover Creek occur within Pastures #1, #3, #5, and #7 within the allotment.

Livestock access to Clover Creek is limited by fencing and topography. Within Pasture #1, livestock can access Clover Creek at one location, Scotch Trail. Water gap fencing was installed at this location and was functioning in 2013, but is in need of repairs. Within Pasture #3, livestock can access Clover Creek in two locations. The first location is Robinson Trail and is near the downstream end of the pasture. A water gap fence is located upstream of this access point, but was not functioning in 2013. Livestock can also access this location from the Juniper Draw Allotment on the west side of Clover Creek. No gap fence exists downstream of this access point, but livestock do not move downstream due to heavy brush. The second location in Pasture #3 is near the upstream pasture boundary. The trail down to the stream at this location is

extremely steep and has not been recently used by livestock. Within Pasture #5, livestock can only access Clover Creek along the Malat Trail. Livestock also have access to this location from the west side of Clover Creek. Within Pasture #7, livestock can only access Clover Creek from state and private lands upstream of BLM managed lands within the pasture.

Five reaches of Clover Creek have been assessed using the BLM Technical Reference 1737-15 for assessing Proper Functioning Condition (PFC) of streams (BLM, 1998) (Table 21). Reach miles assessed varied by year. The most recent assessments from 2004, 2006, and 2014 are displayed in Table 21.

The PFC assessment is a broad-scale assessment that uses hydrology, vegetation, and erosion/deposition (soil) attributes and processes to qualitatively assess the condition of riparian areas. The PFC assessments include ratings of PFC, functioning at risk with an upward trend (FAR-UP), functioning at risk with no apparent trend (FAR-NA), functioning at risk with a downward trend (FAR-DN), and non-functioning (NF).

**Table 21: PFC Assessment Ratings by Stream Reach and Year**

Clover Creek Reaches (miles)	Pasture(s)	Stream Segment Number	2004 Rating	2006 Rating	2014 Rating
35.5-36.4*	1	1	FAR-DN	FAR-UP	PFC
36.4-38.0	1	2	FAR-UP	FAR-UP	No Data
38.0-40.2	1	3	FAR-UP	FAR-UP	PFC**
40.2-41.8	3	4	FAR-NA	FAR-NA	PFC**
41.8-46.0	3,5,7	5	FAR-UP	FAR-UP	PFC

PFC= Proper Functioning Condition, FAR-NA= Functional-At-Risk-No Apparent Trend, FAR-UP=Functional-At-Risk with Upward Trend, FAR-DN= Functional-At-Risk with Downward Trend, No Data= No data collected on the reach.

\* Assessment reach begins 0.3 miles downstream of allotment boundary.

\*\*2014 assessment was combined- 38.0-41.8

## **Evaluation of Standard 2**

### **Pasture #1**

Clover Creek reach **35.5-36.4** was most recently in PFC (2014). This reach is downstream of the Scotch Trail enclosure. Livestock from both the Buck Flat Allotment and Juniper Ranch Allotment have access to portions of this reach. Vegetation items from the most recent PFC assessment were all marked “yes” (Table 14). A “yes” indicates that the stream attribute is appropriate for the reach. Adequate riparian vegetation and a diverse composition of riparian species with multiple age classes is present within the reach, and is able to dissipate stream energy during high flow.

Clover Creek reach **36.4-38.0** was determined to be FAR with an upward trend during the most recent assessment (2006). Most of this reach is within the Scotch Trail enclosure. Two water gaps exist within this reach. One water gap provides access for livestock within the Buck Flat Allotment and the other water gap provides access for livestock in the Juniper Ranch Allotment. Each of the water gaps is approximately 0.2 miles in length. The downstream enclosure fence is in need of repair but was still functioning in 2013. Other fences for the Scotch Trail enclosure

were in good condition. Vegetation items from the PFC assessment were all marked “yes” (Table 21). There is a diverse composition of species and age classes of riparian vegetation within this reach. Riparian vegetation is also adequate to dissipate energy and protect stream banks during high flow events.

Clover Creek reach **38.0-40.2** was most recently in PFC (2014). This reach begins at the upstream of the Scotch Trail enclosure and extends upstream to near the Pasture #1/Pasture #3 boundary of the Buck Flat Allotment. Livestock access to this reach from Pasture #1 of the Buck Flat Allotment is restricted due to topography. Livestock also have access to the downstream portion of this reach from the Juniper Draw Allotment. Vegetation items from the PFC assessment were all marked “yes” (Table 22). There is a diverse composition of species and age classes of riparian vegetation within this reach. Riparian vegetation is also adequate to dissipate energy and protect stream banks during high flow events.

**Table 22: Vegetation Item Ratings from PFC Assessments by Segment and Year in Pasture #1**

Vegetation Item from PFC Assessment Form	Reach 35.5 - 36.4			Reach 36.4 - 38.0		Reach 38.0 - 40.2 (2004 & 2006) Reach 38.0-41.8 (2014)		
	2004	2006	2014	2004	2006	2004	2006	2014
There is a diverse age class distribution of riparian-wetland vegetation (recruitment for maintenance and recovery) (6)	No	Yes	Yes	Yes	Yes	No	Yes	Yes
There is a diverse composition of riparian-wetland vegetation (for maintenance/recovery) (7)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Species present indicate maintenance of riparian-wetland soil moisture characteristics (8)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-stream flow events (9)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Riparian plants exhibit high vigor (10)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows (11)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plant communities in the riparian area are an adequate source of coarse and/or large woody material (for maintenance/recovery) (12)	No	N/A	Yes	No	N/A	Yes	N/A	Yes

**Pasture #3**

Clover Creek reach **40.2 to 41.8** was most recently in PFC (2014). This reach extends from the Pasture #1/ Pasture #3 boundary upstream to near Pasture #3/Pasture #5 boundary. Livestock have access to this reach near Robinson Trail from both the Buck Flat Allotment and the Juniper Draw Allotment. The fence separating the livestock from the two allotments was not functional in 2013. Vegetation items from the most recent PFC assessment were all marked “yes” (Table 23).

**Pastures #3, #5 and #7**

Clover Creek reach **41.8-46.0** was most recently in PFC (2014). This reach extends from near the Pasture #3/Pasture #5 boundary upstream to the upstream most extent of BLM managed land along Clover Creek within the allotment. Livestock can access this reach in several locations. The primary access location for livestock within the Buck Flat Allotment is Malat Trail. Livestock can also access the Malat Trail area from the Juniper Draw Allotment on the west side of Clover Creek. The other location is near the downstream end of the reach. This downstream access location receives little use by livestock due to the steep terrain. Vegetation items from the most recent PFC assessment were all marked “yes” (Table 23). There is a diverse composition of species and age classes of riparian vegetation within this reach. Riparian vegetation is also adequate to dissipate energy and protect stream banks during high flow events.

**Table 23: Vegetation Indicator Ratings from PFC Assessments by Segment and Year in Pastures #3, #5 and #7**

Vegetation Item from PFC Assessment Form	Reach 40.2 – 41.8 (2004 & 2006) Reach 40.2--41.8 (2014)			Reach 41.8 – 46.0		
	2004	2006	2014	2004	2006	2014
	There is a diverse age class distribution of riparian-wetland vegetation (recruitment for maintenance and recovery) (6)	No	Yes	Yes	Yes	Yes
There is a diverse composition of riparian-wetland vegetation (for maintenance/recovery) (7)	Yes	Yes	Yes	Yes	Yes	Yes
Species present indicate maintenance of riparian-wetland soil moisture characteristics (8)	No	Yes	Yes	Yes	Yes	Yes
Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-stream flow events (9)	No	Yes	Yes	Yes	Yes	Yes
Riparian plants exhibit high vigor (10)	Yes	Yes	Yes	Yes	Yes	Yes
Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows (11)	No	Yes	Yes	No	Yes	Yes
Plant communities in the riparian area are an adequate source of coarse and/or large woody material (for maintenance/recovery) (12)	Yes	Yes	Yes	Yes	Yes	Yes

\*Assessment reach in 1998 began in Pasture #1 and extended upstream through the Pastures #3, #5, and #7

***Evaluation Finding – Pastures #1, #3, #5, and #7 are:***

Meeting the Standard

Not meeting the Standard, but making significant progress towards meeting

Not meeting the Standard

***Rationale for Evaluation Finding***

Standard 2 is being met in Pastures #1, #3, #5 and #7 and is not applicable to Pastures #2, #4 and #6. Clover Creek reaches 35.5-36.4, 38.0-41.8 and 41.8-46.0 were all in proper functioning condition during the most recent PFC assessments, and reach 36.4-38.0 was FAR with an upward trend. There was a diverse composition of species and age classes of riparian vegetation and recruitment of woody riparian species was occurring within these reaches. The abundant and diverse woody and herbaceous vegetation indicated riparian and wetland soils are being maintained. Riparian vegetation was sufficient to stabilize streambanks, filter sediment, and dissipate energy during high flow events.

Stream bank stability within the reaches is within an appropriate range, and stream attributes (width/depth ratio, sinuosity) are appropriate for the stream type. Within these reaches, Clover Creek has access to the floodplain and the stream channel is able to dissipate energy during high flows.

**Standard 3 (Stream Channel & Floodplain)**

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

**Pastures #2, #4, and #6:**

Standard Doesn't Apply

All streams within Pastures #2, #4, and #6 of the Buck Flat AMP Allotment are classified as ephemeral (USGS 2014; National Hydrography Dataset). Ephemeral streams only flow in direct response to precipitation and are above the water table throughout the year (BLM 1998). Riparian vegetation, springs, or wetlands are not present within the pastures. Therefore, Standard 3 does not apply to Pastures #2, #4, and #6 of the Buck Flat AMP Allotment.

**Pastures #1, #3, #5, and #7:**

**Rangeland Health Assessment**

See Rangeland Health Assessment for Standard 2 for a description of water and riparian resources within Pastures #1, #3, #5, and #7.

**Evaluation of Standard 3**

**Pasture #1**

Clover Creek reach **35.5-36.4** was most recently rated in PFC (2014). Two of the hydrology and erosion/deposition items from the most recent PFC assessment were marked “no” (Table 24). Indicators 5 and 17 were both marked “no” because the upland watershed is contributing fine sediment into the system and there are high amounts of sediment within the stream channel; however, the condition appeared to be improving. The stream is narrowing and sinuosity is

increasing. Fines are being deposited on the floodplain and being stabilized by herbaceous and woody vegetation. Beaver are active within the reach and raising the water table and widening the riparian area.

Clover Creek reach **36.4-38.0** was FAR with an upward trend during the most recent PFC assessment (2006). All hydrology and erosion/deposition items from the most recent assessment were marked “yes” except indicator 17. Item 17 (stream is in balance with the water and sediment being supplied by the watershed) was marked “no” due to the excessive sediment load.

Clover Creek reach **38.0-40.2** was most recently rated in PFC (2014). All hydrology and erosion/deposition items from the most recent assessment were marked “yes” except indicators 5 and 17. Indicators 5 and 17 were both marked “no” because the upland watershed is contributing fine sediment into the system and there are high amounts of sediment within the stream channel. Livestock trailing from the uplands to the stream is a source of localized sediment transport to the riparian zone; however, the condition appeared to be improving.

**Table 24: Hydrology and Erosion/Deposition Item Rating from PFC Assessment Forms by Segment and Year in Pasture #1**

Hydrology and Erosion/Deposition Item from PFC Assessment Form	Reach 35.5 – 36.4			Reach 36.4 – 38.0		Reach 38.0 - 40.2		
	2004	2006	2014	2004	2006	2004	2006	2014
Floodplain above bank-full inundated in "relatively frequently" events (1-3 years) (1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active/stable beaver dams, where present (2)	N/A	N/A	Yes	Yes	N/A	N/A	N/A	Yes
Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) (3)	No	No	Yes	No	Yes	No	Yes	Yes
Riparian zone is widening or has achieved potential extent (4)	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Upland watershed is not contributing to riparian-wetland degradation (5)	No	Yes	No	No	Yes	Yes	Yes	No
Floodplain and channel characteristics (i.e. rocks, overflow channels, coarse and/or large woody debris) are adequate to dissipate energy (13)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Point bars are revegetating with riparian-wetland vegetation (14)	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lateral stream movement is associated with natural sinuosity (15)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
System is vertically stable (16)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion and deposition) (17)	No	No	No	No	No	No	No	No

**Pasture #3**

Clover Creek reach **40.2-41.8** was most recently rated in PFC (2014). All hydrology and erosion/deposition indicators from the most recent assessment were marked “yes” except items 5 and 17 (Table 25). Indicators 5 and 17 were both marked “no” because the upland watershed is contributing fine sediment into the system and there are high amounts of sediment within the stream channel. Livestock trailing from the uplands to the stream is a source of localized sediment transport to the riparian zone; however, the condition appeared to be improving.

**Pastures #3, #5 and #7**

Clover Creek reach **41.8-46.0** was most recently rated in PFC (2014). All hydrology and erosion/deposition items from the most recent assessment were marked “yes” except item 2 and 17 (Table 25). Item 2 was marked “no” because there was evidence of historic beaver dams and activity; however, no active dams were observed. Indicator 17 was marked “no” because there was an elevated amount of fine sediments in the stream channel due to past uses or events. However, the vegetation is increasing and stabilizing the fines on the floodplain as would be expected for a recovering stream.

**Table 25: Hydrology and Erosion/Deposition Item Rating from PFC Assessment Forms by Segment and Year in Pastures #3, #5 and #7**

Hydrology and Erosion/Deposition Item from PFC Assessment Form	Reach 40.2-- 41.8			Reach 41.8 – 46.0		
	2004	2006	2014	2004	2006	2014
Floodplain above bank-full inundated in "relatively frequently" events (1-3 years) (1)	Yes	Yes	Yes	Yes	Yes	Yes
Active/stable beaver dams, where present (2)	N/A	N/A	Yes	Yes	Yes	No
Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region) (3)	Yes	Yes	Yes	Yes	Yes	Yes
Riparian zone is widening or has achieved potential extent (4)	Yes	Yes	Yes	Yes	Yes	Yes
Upland watershed is not contributing to riparian-wetland degradation (5)	Yes	Yes	No	No	Yes	Yes
Floodplain and channel characteristics (i.e. rocks, overflow channels, coarse and/or large woody debris) are adequate to dissipate energy (13)	Yes	Yes	Yes	Yes	Yes	Yes
Point bars are revegetating with riparian-wetland vegetation (14)	N/A	N/A	Yes	Yes	N/A	Yes
Lateral stream movement is associated with natural sinuosity (15)	Yes	Yes	Yes	Yes	Yes	Yes
System is vertically stable (16)	Yes	Yes	Yes	Yes	Yes	Yes
Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion and deposition) (17)	Yes	No	No	No	No	No

***Evaluation Finding – Pastures #1, #3, #5, and #7 are:***

Meeting the Standard

Not meeting the Standard, but making significant progress towards meeting

Not meeting the Standard

***Rationale for Evaluation Finding***

Standard 3 is being met in Pastures #1, #3, #5 and #7, and is not applicable to Pastures #2, #4 and #6. Clover Creek reaches 35.5-36.4, 38.0-41.8 and 41.8-46.0 were all in proper functioning condition during the most recent PFC assessments and reach 36.4-38.0 was FAR with an upward trend. These reaches all contain an excessive amount of fine sediment; however, the condition appeared to be improving. Streambank stability within the reaches is within an appropriate range and stream attributes (width/depth ratio, sinuosity) are appropriate for the stream type. Within these reaches, Clover Creek has access to the floodplain allowing the stream channel to dissipate energy during high flows.

**Standard 4 (Native Plant Communities)**

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

**Rangeland Health Assessment**

All pastures of the Buck Flat AMP Allotment are evaluated under Standard 4. The allotment is dominated by native plant communities, as shown by the vegetation cover data (Tables 26, 27, and 28). Field notes recorded during the 2013 IIRH monitoring indicate the presence of native shrubs, grasses, and forbs. No noxious weed species were noted at the sites during the evaluation.

Indicators for Rangeland Health were assessed at five locations within the allotment; four HAF sites and one ESI site. The vegetative cover data has been summarized below in Table 26. Vegetative cover data was collected at multiple layers; however, Table 26 displays only the top cover layer to allow comparison of cover data to ESD reference sheet values. Sandberg bluegrass comprises the highest average percent of cover (top layer) at the sites, followed by Wyoming big sagebrush, biological soil crusts, and annual grasses. Percent bare ground ranged from 11-27 percent. Total litter, including standing litter and litter in contact with the soil, ranged from 6-26 percent. Vegetative cover data was collected at eleven HAF sites in 2013.

**Table 26: IIRH Site Data - Percent Vegetative Cover (Top layer)**

Pasture		#1	#2	#3	#5	#6
IIRH Site ID		BF-1	BF-2	BF-3	BF-5	BF-6
Vegetation Class	Species	ESI 2006-RA-37	HAF BF-2	HAF BF3-1	HAF BF5-2	HAF BF-6
Perennial Grasses	Bluebunch Wheatgrass	1.3%	3%	1%	5%	1%
	Bottlebrush Squirreltail	1.3%	2%	0%	0%	9%
	Sandberg Bluegrass	25.3%	13%	18%	18%	22%
	Thurber's Needlegrass	0%	2%	1%	0%	1%
	Western Wheatgrass	0%	0%	0%	0%	0%
Annual Grasses	Cheatgrass	0%	4%	0%	6%	4%
	Sixweeks Fescue	0%	1%	0%	0%	0%
Perennial Forbs	Carpet Phlox	0%	0%	1%	0%	0%
	Longleaf Phlox	0%	0%	0%	2%	0%
	Pale Agoseris	0%	0%	0%	2%	1%
	Prickly-leaved Phlox	0%	0%	0%	4%	0%
	Sagebrush Phlox	0.7%	0%	0%	0%	2%
	Spiny Phlox	0.7%	0%	0%	0%	0%
	Shaggy Fleabane	0%	0%	0%	0%	0%
Annual Forbs	Clasping Pepperweed	0%	0%	0%	1%	3%
	Curvseed Butterwort	0%	0%	0%	0%	1%
	Small Blue Eyed Mary	0%	0%	1%	0%	0%
	Spring Draba	0%	1%	1%	1%	2%
	Tall Annual Willowherb	0%	0%	0%	1%	2%
	Tumblemustard	0%	0%	0%	1%	1%
	Western Tansymustard	0%	0%	0%	1%	0%
	Yellow Salsify	0%	0%	0%	0%	2%
Shrubs	Rubber Rabbitbrush	4.7%	0%	0%	1%	0%
	Yellow Rabbitbrush	18.0%	0%	0%	0%	0%
	Wyoming Big Sagebrush	0%	21%	26%	0%	1%
	Unknown*	11.3%	0%	0%	0%	0%
<b>Vegetation Total</b>		<b>63.3%</b>	<b>47%</b>	<b>49%</b>	<b>43%</b>	<b>52%</b>
Other Cover	Bare Ground	25.3%	18%	19%	27%	11%
	Biological Soil Crust	3.3%	20%	13%	4%	23%
	Litter in Contact with Soil	2.7%	12%	12%	15%	10%
	Litter Standing	4.0%	2%	6%	10%	4%
	Persistent Litter	0%	1%	1%	1%	0%
	Rock or Gravel	1.3%	0%	0%	0%	0%
<b>Grand Total</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

\*This was recorded as "Unknown 1" but after a review of the photos, the IDT concluded it was most likely broom snakeweed (*Gutierrezia sarothrae*) and should be considered as a shrub component.

Vegetative cover data were also recorded in other areas of the Buck Flat AMP Allotment in 2006 (ESI) and 2013 (HAF). The 2013 HAF data are summarized below in Table 27. In addition, the 2006 ESI cover data is summarized in Table 28. Vegetative cover data was collected at multiple layers; however, Tables 27 and 28 display only the top layer.

**Table 27: Percent ground cover (top layer) recorded in 2013 in other areas of the Buck Flat AMP Allotment**

HAF Monitoring Site Per Pasture		#1	#3	#4	#4	#5	#7	#7
Vegetation Class	Species	HAF BF1-1	HAF BF3-2	HAF BF4-1	HAF BF4-2	HAF BF5-1	HAF BF7-1	HAF BF7-2
Perennial Grasses	Bluebunch Wheatgrass	0%	2%	0%	3%	1%	0%	15%
	Bottlebrush Squirreltail	3%	0%	0%	3%	0%	0%	0%
	Sandberg Bluegrass	13%	23%	24%	15%	22%	22%	11%
	Thurber's Needlegrass	0%	0%	0%	4%	0%	0%	0%
	Western Wheatgrass	0%	0%	1%	3%	1%	1%	0%
Annual Grasses	Cheatgrass	7%	7%	0%	13%	1%	0%	0%
	Sixweeks Fescue	0%	0%	0%	0%	0%	0%	0%
Perennial Forbs	Carpet Phlox	0%	0%	0%	0%	0%	0%	0%
	Longleaf Phlox	0%	2%	0%	0%	0%	0%	1%
	Pale Agoseris	0%	0%	0%	0%	0%	1%	0%
	Sagebrush Phlox	0%	0%	0%	0%	1%	0%	0%
	Shaggy Fleabane	0%	1%	0%	0%	0%	0%	0%
Annual Forbs	Curvseed Butterwort	0%	1%	0%	0%	0%	0%	0%
	Nodding Chickweed	0%	0%	0%	1%	0%	0%	0%
	Slender Phlox	1%	0%	0%	0%	0%	0%	0%
	Tall Annual Willowherb	0%	2%	0%	0%	0%	0%	0%
	Tumblemustard	1%	1%	0%	2%	0%	0%	0%
	Yellow Salsify	0%	0%	0%	1%	0%	0%	0%
Shrubs	Rubber Rabbitbrush	0%	0%	0%	0%	0%	0%	0%
	Wyoming Big Sagebrush	15%	0%	33%	4%	14%	27%	0%
	Yellow Rabbitbrush	11%	1%	0%	8%	0%	0%	4%
<b>Vegetation Total</b>		<b>51%</b>	<b>40%</b>	<b>58%</b>	<b>57%</b>	<b>40%</b>	<b>51%</b>	<b>31%</b>
Other Cover	Bare Ground	26%	40%	10%	10%	16%	31%	44%
	Biological Soil Crust	11%	1%	23%	4%	34%	14%	7%
	Litter in Contact with Soil	7%	7%	5%	19%	5%	2%	14%
	Litter Standing	4%	8%	4%	9%	3%	1%	0%
	Persistent Litter	1%	2%	0%	0%	1%	1%	1%
	Rock or Gravel	0%	2%	0%	1%	0%	0%	3%
<b>Grand Total</b>		<b>100%</b>						

**Table 28: Percent ground cover (top layer) recorded in 2006 in other areas of the Buck Flat AMP Allotment**

ESI Monitoring Site Per Pasture		#3	#3	#6
Vegetation Class	Species	ESI 2006-RA-6a	ESI 2006-RA-77a	ESI 2006-RA-8a
Perennial Grasses	Bluebunch Wheatgrass	0%	0%	0.7%
	Bottlebrush Squirreltail	0%	0%	0.7%
	Crested Wheatgrass	0%	0%	2.0%
	Needle and Thread	0%	0.7%	0%
	Sandberg Bluegrass	8.0%	16.0%	12.0%
Annual Grasses	Cheatgrass	2.7%	0%	18.7%
	Sixweeks Fescue	0%	0%	0%
Perennial Forbs	Longleaf Phlox	0%	0%	0%
	Pale Agoseris	0%	0%	0%
	Sagebrush Phlox	0%	1.3%	0%
	Small Blue Eyed Mary	0%	0.7%	0%
	Tall Annual Willowherb	0%	0.7%	1.3%
	Tumblemustard	0.7%	0%	7.4%
Shrubs	Rubber Rabbitbrush	20.0%	28.0%	17.3%
	Wyoming Big Sagebrush	0.7%	12.7%	5.3%
	Yellow Rabbitbrush	14.7%	0%	0%
Unknown		0.7% ^	0.7% ^^	0%
<b>Vegetation Total</b>		<b>47.5%</b>	<b>60.8%</b>	<b>65.4%</b>
Other Cover	Bare Ground	42.0%	6.7%	7.3%
	Biological Soil Crust	2.0%	7.3%	0%
	Litter in Contact with Soil	6.0%	9.3%	17.3%
	Litter Standing	2.7%	16.0%	10.0%
	Persistent Litter	0%	0%	0%
	Rock or Gravel	0%	0%	0%
<b>Grand Total</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

^ = Unknown Forb; ^^ = Borage

**Pasture #1**

**IIRH Site BF1 (Loamy 8-12")**

Site BF1 (Photo 17) is located in a native vegetation community where Sandberg bluegrass is the dominant grass species (25% cover) and yellow rabbitbrush is the dominant shrub species (18% cover). In addition, biological soil crusts comprise 3 percent of cover (Table 26). The site is of relatively flat topography with a north aspect. The site last burned in the 1973 Clover Flat Fire and was not reseeded following the fire.

**Photo 17: IIRH Site BF1 - June 27, 2013**



Due to a reduced amount of deep-rooted perennial bunchgrasses, and rabbitbrush being co-dominant with sagebrush, the functional/structural groups indicator was rated as slight to moderate departure.

The indicator for litter amount was rated as a moderate departure from the reference condition due to an increased amount of litter (35.0% cover for all layers) found at the site.

Cheatgrass (*Bromus tectorum*) was not recorded in the 2006 cover data but was noted in the IIRH field notes as being common along the roads and disturbed areas but becoming scattered further away from the road. Curveseed butterwort was noted as also being present in disturbed areas. With the combination of cheatgrass being common and curveseed butterwort being found in some disturbed areas, the indicator for invasive plants was rated moderate to extreme.

All other indicators related to the Biotic Integrity attribute were rated none to slight. The Biotic Integrity attribute was rated as a moderate departure from the reference condition due a shift in the functional structural groups, an increased amount of litter, and the presence of invasive species.

### **Pasture #2**

#### **IIRH Site BF2 (Loamy 8-12")**

Site BF2 (Photo 18) is located in a Wyoming big sagebrush/Sandberg bluegrass vegetation community where Sandberg bluegrass was the dominant perennial bunchgrass at 13 percent of cover (Table 26). Bluebunch wheatgrass was 3 percent and Thurber's Needlegrass and bottlebrush squirreltail were each 2 percent of cover. Wyoming big sagebrush was 21 percent of

cover and biological soil crusts comprise 20 percent of cover. The site is of relatively flat topography with a north aspect and has not burned in over 50 years. A soil stability test (Pellant et al., 2005) was completed at the site and the soil stability value averaged 5.7, indicating adequate soil surface resistance to erosion.

**Photo 18: IIRH Site BF2 - June 18, 2013**



The indicator for litter amount was rated as a moderate departure from the reference condition due to an increased amount of litter (31.0% cover for all layers) found at the site.

Cheatgrass was recorded at 4 percent of cover (top layer) and was noted in the IIRH field notes as being dominant in small patches and scattered throughout the pasture. With the combination of cheatgrass being common and curvseed butterwort being found in some disturbed areas, the indicator for invasive plants was rated as a slight to moderate departure.

All other indicators related to the Biotic Integrity attribute were rated none to slight. The Biotic Integrity attribute was rated as a slight to moderate departure from the reference condition due an increased amount of litter and the presence of invasive species.

### **Pastures #3 and #4**

#### **IIRH Site BF3 (Loamy 8-12")**

Site BF3 (Photo 19) is located in Pasture #3 but is also representative of Pasture #4. BF#3 is located in a Wyoming big sagebrush/Sandberg bluegrass vegetation community where Sandberg bluegrass is the dominant grass species at 18 percent cover (Table 26). Thurber's Needlegrass and bluebunch wheatgrass were both present at 1 percent cover. Wyoming big sagebrush was 26 percent cover and yellow rabbitbrush was noted as being present. In addition, biological soil

crusts comprise 13 percent of cover (top layer). The site is of relatively flat topography with a north aspect. The site last burned in the 1973 Clover Flat Fire and was not reseeded following the fire.

**Photo 19: IIRH Site BF 3 - June 18, 2013**



The indicator for litter amount was rated as a slight to moderate departure from the reference condition due to an increased amount of litter (21.0% cover for all layers) found at the site.

Cheatgrass and Curvseed butterwort was recorded at 0 percent of cover (top layer); however, curvseed butterwort was noted in the IIRH field notes as being scattered near some of the disturbed areas of the pasture. The indicator for invasive plants was rated as a none to slight departure.

All other indicators related to the Biotic Integrity attribute were rated none to slight. The Biotic Integrity attribute was rated as a none to slight departure from the reference condition.

### **Pasture #5**

#### **IIRH Site BF5 (Loamy 10-13")**

Site BF5 (Photo 20) is located in Pasture #5, but is also representative of Pasture #7 and is located in a native vegetation community where Sandberg bluegrass is the dominant grass species at 18 percent cover and bluebunch wheatgrass is 5 percent (Table 26). Wyoming big sagebrush cover was lacking and rubber rabbitbrush was present at 1 percent cover. In addition, biological soil crusts comprise 4 percent of the cover. The site is of relatively flat topography with a north aspect. The site burned in the 1973 Clover Flat Fire and again in the 2007 Murphy Complex Fire. The site has not been drill seeded but Wyoming big sagebrush was aerially seeded

in strips in 2008. A soil stability test (Pellant et al., 2005) was completed at the site and the soil stability value averaged 4.7, indicating adequate soil surface resistance to erosion.

**Photo 20: IIRH Site BF5 - June 18, 2013**



The indicator for soil surface loss or degradation were rated as a slight to moderate departure due to the evidence of past soil loss as expressed by pedestals being present. The site appeared stable and there were no signs of active erosion.

Due to a reduced amount of deep-rooted perennial bunchgrasses, lack of Wyoming big sagebrush, and rabbitbrush only being present at 1 percent cover, the functional/structural group indicator was rated as slight to moderate departure.

The indicator for litter amount was rated as a moderate departure from the reference condition due to an increased amount of litter (38.0% cover for all layers) found at the site.

Cheatgrass was recorded at 6 percent of cover on the HAF transect and was noted in the IIRH field notes as being common throughout the site. Curveseed butterwort, tall tumbled mustard (*Sisymbrium altissimum*), and western tansymustard (*Descurainia pinnata*) were also noted as being common throughout the site. With the combination of cheatgrass and other invasive species being common on the site, the indicator for invasive plants was rated as a moderate to extreme departure.

Five of the seven other indicators related to the Biotic Integrity attribute were rated as a none to slight departure and the remaining two indicators were rated as a slight to moderate departure. With this, the Biotic Integrity attribute was rated as a moderate departure from the reference

condition due to the presence and amount of invasive species present, some soil loss evidenced by pedestals, and an increased amount of litter.

**Pasture #6**

**IIRH Site BF6 (Loamy 8-12")**

Site BF6 (Photo 21) is located in a native vegetation community. Cover data collected at the site shows Sandberg bluegrass is the dominant grass species at 22 percent cover, bottlebrush squirreltail is 9 percent cover, and bluebunch wheatgrass and Thurber's Needlegrass are each present at 1 percent cover (Table 26). Sagebrush phlox, spring draba, yellow salsify and annual Willowherb are each present at 2 percent cover. Wyoming big sagebrush has been reduced by wildfire but is present at 1 percent and showing signs of reproduction and recruitment. Biological soil crusts comprise 23 percent of the cover. The site is of relatively flat topography with a north aspect and was burned by wildfire in the 2007 Murphy Complex Fire.

**Photo 21: IRRH Site BF6 - June 27, 2013**



The indicator soil surface loss or degradation was rated as a slight to moderate departure due to the evidence of past soil loss as expressed by a reduced organic layer in the soil profile. The site appeared stable and there were no signs of active erosion.

The indicator for functional structural group was rated as a slight to moderate departure from the reference condition due to the reduced shrub component at the site. However, recruitment of Wyoming big sagebrush was observed and noted in the IIRH field notes.

The indicator for litter amount was rated as a slight to moderate departure from the reference condition due to an increased amount of litter (42.0% cover for all layers) found at the site.

Scattered amounts of invasive species, notably tall tumbled mustard and clasping pepperweed (*Lepidium perfoliatum*), were observed and noted in the IIRH field notes. Due to the presence of these invasive species, the indicator for invasive plants was rated as a slight to moderate departure.

Five of the seven other indicators related to the Biotic Integrity attribute were rated as a none to slight departure and the remaining two indicators were rated as a slight to moderate departure. With this, the Biotic Integrity attribute was rated as a slight to moderate departure from the reference condition due to the presence of invasive species present and the shift in the functional/structural groups due to the lack of shrubs present.

The IIRH notes also state that this site was “not representative of the pasture”; however, the JFO IDT followed protocol and completed the IIRH at the site because it is a HAF site. The notes also state that “this site was not reseeded following the 2007 Murphy Complex Fire but the majority of the pasture is productive and vigorous bluebunch wheatgrass.” After reviewing the GIS data, including the seeding layer, approximately 700 acres south of the monitoring site were drilled seeded following the 2007 Murphy Complex Fire.

**Allotment Summary for Standard 4 (Native Plant Communities):**

The Biotic Integrity attribute was none to slight at site BF3, slight to moderate at sites BF2 and BF6, and moderate at sites BF1 and BF5.

The indicator for soil surface loss or degradation was rated at a slight to moderate departure from the reference condition at sites BF5 and BF6, and none to slight at the remaining three sites (BF1, BF2, and BF3).

The functional/structural group indicator was rated slight to moderate at site BF1 due to the reduced relative dominance of deep-rooted perennial bunchgrass and increase of shallow rooted perennial grasses. In addition, site BF5 was also rated slight to moderate due to the high amount of annuals at the site in combination with a lack of shrubs. Meanwhile, site BF6 was also rated slight to moderate for the functional/structural group indicator due to the lack of shrubs. The functional/structural group indicator was rated none to slight departure from reference condition at the other two sites (BF2 and BF3).

The litter amount indicator was rated slight to moderate departure at sites BF3 and BF6 and moderate at sites BF1, BF2, and BF5. Percentages of litter used to evaluate the litter indicator included not only detached litter in contact with soil but also standing litter.

Invasive plants were rated slight to moderate departure from the reference condition at site BF6, moderate at site BF2, and moderate to extreme at sites BF1 and BF5. Invasive plants such as cheatgrass, curvseed butterwort, clasping pepperweed, and tansy mustard ranged from being found only within disturbed areas at some sites to being common throughout other sites.

#### **Evaluation of Standard 4**

##### **All Pastures (#1, #2, #3, #4, #5, #6, and #7)**

Some evidence of past soil surface loss was noted at the IRRH sites in Pastures #5 and #6. Soil movement appeared to have occurred in the area following the 2007 Murphy Complex Fire. However, there is no evidence of active soil movement in either pasture. Adequate ground cover is present in all pastures to protect the soil from accelerated erosion.

Wildfires removed shrubs across Pastures #5, #6, and #7 and some areas of Pastures #3 and #4. Since the fire, rabbitbrush and Wyoming big sagebrush have begun to reestablish in the burned areas. Large statured, deep-rooted perennial bunchgrasses were noted to be present at the IIRH sites in each pasture, although they were noted to occur at reduced levels in most areas. This presence of deep-rooted perennial bunchgrasses resulted in a “none to slight” or “slight to moderate” deviation rating for the functional/structural group indicator at each of the five IIRH sites. However, cover data (Tables 26 – 28) recorded at fourteen different sites throughout the allotment from 2006 through 2013 indicate that deep-rooted perennial bunchgrasses are absent or reduced in most areas of the allotment. In addition, 2006 ESI production data (Table 9) indicate that shallow rooted perennial bunchgrasses are dominant over deep-rooted perennial bunchgrasses at four sites within the allotment. Upland trend data shows that the frequency of deep-rooted perennial bunchgrasses have decreased at one site in Pasture #2; remained static at another site in Pasture #2 and at sites in Pastures #1, #6, and #7; and has increased at one site in Pasture #4.

Cheatgrass ranged from 0 to 19 percent of cover (top layer) across all cover sites within the allotment (Tables 26 – 28). Invasive plants such as cheatgrass, curvseed butterwort, clasping pepperweed, and tansy mustard ranged from being found only within disturbed areas (rodent mounds, etc.) to being common throughout other areas. Diffuse knapweed, a noxious weed species, has also been noted to occur within the Buck Flat Allotment.

Through the late 2000s, the Buck Flat AMP Allotment was managed under the Devil Creek Allotment Management Plan (AMP) which outlined a rest rotation system where each pasture was to receive season long rest from livestock grazing every fourth year. The AMP did not establish a limit on AUMs within the allotment and allowed pastures to be utilized to their fullest extent, based on the condition of cattle as determined by the range user. Since the implementation of the AMP, the allotment has typically been grazed by cattle each year from mid-March through mid-July. Utilization levels measured since 2008 has averaged 15 percent on Thurber’s needlegrass and 12 percent on Sandberg bluegrass. Utilization data were collected only once (2011) on bluebunch wheatgrass and averaged 5 percent utilization in Pasture #6. Utilization data were also measured only once (2009) on squirreltail which averaged 42 percent within Pasture #3.

Upland trend data collected at seven sites across the allotment show that bare ground has decreased since 1993/1994. Meanwhile, vegetative cover has decreased at one site, remained static at another site, and has increased at the remaining five sites. Current data shows that biological soil crusts are present at each site. Occurrences of the key species Thurber’s needlegrass and bluebunch wheatgrass have remained static at most sites. However, Thurber’s needlegrass has decreased at one of the two sites within Pasture #2. Additionally, bluebunch

wheatgrass has increased at the site in Pasture #4. The key species Sandberg bluegrass has increased at most of sites across the allotment. Western wheatgrass is a key specie at one of the two sites in Pasture #2, and has decreased at that site. Sagebrush was removed from three of the sites (Pastures #4, #6, and #7) by the 2007 Murphy Complex Fire; sagebrush has remained static at two of the remaining sites and has decreased at the other two sites.

***Evaluation Finding – All Pastures (#1, #2, #3, #4, #5, #6 and #7) are:***

- Meeting the Standard
- Not meeting the Standard, but making significant progress towards meeting
- Not meeting the Standard

***Rationale for Evaluation Finding***

Deep-rooted perennial bunchgrasses within the native plant communities of the Buck Flat AMP Allotment are not the dominant functional/structural group, as described in the ESD reference state. Rather, the native plant communities are dominated by Sandberg bluegrass, a shallow rooted, small statured perennial bunchgrass. This is indicative of a shift in the relative dominance of vegetation functional/structural groups. Declines in deep-rooted perennial bunchgrasses can result in a modification of nutrient cycling and energy flow due to changes in above and below ground structure. Shallow-rooted perennial grasses generally have a shorter active growth period, smaller root systems, and relatively lower potential to capture and store carbon below ground. Shrubs are increasing within the area burned by wildfire in 2007, although they are currently at low densities in these areas. Many areas of the allotment have high amounts of rabbitbrush.

Invasive plants such as cheatgrass, curvseed butterwort, clasping pepperweed, and tansy mustard are of concern in many areas of the allotment. Invasive species can become a threat to biotic integrity and can influence ecological processes.

Overall, upland trend data within the allotment show that bare ground has decreased over time. Cover of live vegetation has increased or remained static at six of the seven sites. The most recent trend data shows biological soil crusts are present at each site. Cheatgrass has increased significantly at four of the sites and decreased significantly at the remaining three sites. Sagebrush was removed from three of the sites (Pastures #4, #6, and #7) by the 2007 Murphy Complex Fire; sagebrush has remained static at two of the remaining sites and has decreased at the other two sites.

Although some small improvements within some of the native plant communities of the Buck Flat AMP Allotment have been shown, the native plant communities are not currently functioning to maintain or promote healthy, productive, and diverse native plant populations. Due to the reduction of deep-rooted perennial bunchgrasses and increased relative dominance of Sandberg bluegrass, in combination with high amounts of invasive annuals, the diversity of native species has not been maintained or improved within the allotment.

**Standard 5 (Seedings)**

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

X Standard Doesn't Apply

Although a small portion of the Buck Flat AMP Allotment has been seeded with perennial native and non-native grass species, the JFO ID team determined that the allotment should be assessed as a native plant community rather than a seeded plant community.

**Standard 6 (Exotic Plant Communities, Other than Seedings)**

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

X Standard Doesn't Apply

The plant communities with the Buck Flat AMP Allotment are dominated by native species. Standard 6 does not apply to the allotment.

**Standard 7 (Water Quality)**

*Surface and ground water on public lands comply with the Idaho Water Quality Standards.*

**Pastures #2, #4, and #6:**

X Standard Doesn't Apply

The Idaho Department of Environmental Quality (IDEQ) has not completed water quality assessments within Pastures #2, #4, and #6 of the Buck Flat AMP Allotment due to the absence of perennial and intermittent streams. Beneficial uses have not been designated within the pastures (IDEQ, 2014). Due to the absence of intermittent or perennial water bodies, Standard 7 does not apply to Pastures #2, #4, and #6 of the Buck Flat AMP Allotment.

**Pastures #1, #3, #5, and #7:**

**Rangeland Health Assessment**

See Standard 2 for a description of water resources within the allotment.

**Evaluation of Standard 7**

The reaches of Clover Creek that occur within pastures #1, #3, #5, and #7 of the allotment are within Idaho Department of Environmental Quality (IDEQ) Assessment Unit (AU) ID17050102SW028\_04 (IDEQ 2014). Therefore, Standard 7 applies to these pastures. The AU is listed by IDEQ as not supporting the designated beneficial uses of cold water aquatic life, primary contact recreation and salmonid spawning (IDEQ 2014; Table 29). The causes listed for the AU failing to support designated beneficial uses are *Escherichia coli* and water temperature. In 2000, the IDEQ developed, and in 2001 the Environmental Protection Agency approved, the Bruneau Subbasin Assessment and Total Maximum Daily Loads (TMDL) of the 303(d) Water Bodies (IDEQ 2000). This subbasin assessment developed a TMDL for *E. coli* for the portions of Clover Creek within the allotment and changed the water quality impairment category for Clover Creek from a Category 5 stream (Streams for which a TMDL is needed) to the list of Category 4a streams (Impaired Waters with Approved TMDLs). For water temperature, the portions of Clover Creek within the allotment are included in the IDEQ 2012 Integrated Report as a

Category 5 stream (IDEQ 2014). IDEQ is currently in the process of developing a TMDL for water temperature impairment within the Bruneau Subbasin.

**Table 29: IDEQ information for the Buck Flat Allotment**

Assessment Unit#	AU Name	Pasture the AU occurs in	Beneficial Use Not Meeting	Pollutant/ Pollution	Total Maximum Daily Load (TMDL)
ID17050102SW028_04	Clover Creek - 4th order (Deadwood Creek to Buck Flat Draw)	1, 3, 5, 7	CWAL <sup>1</sup> PCR <sup>2</sup> SS <sup>3</sup>	Temperature E. coli	No Yes

<sup>1</sup>CWAL = cold water aquatic life

<sup>2</sup>Primary Contact Recreation

<sup>3</sup>Salmonid Spawning

**Evaluation Finding – Pastures #1, #3, #5, and #7 are:**

- Meeting the Standard
- Not meeting the Standard, but making significant progress towards meeting
- Not meeting the Standard

**Rationale for Evaluation Finding**

Standard 7 is not being met for Clover Creek in pastures #1, #3, #5, and #7 of the allotment based on IDEQ beneficial use support status and water quality impairment information (IDEQ 2014). The AU within the allotment is listed by IDEQ as not supporting the designated beneficial use of cold water aquatic life due to *E. coli* and water temperature. Therefore, the portion of Clover Creek within the Buck Flat AMP Allotment is not meeting Standard 7.

**Standard 8 (Threatened, Endangered and BLM Sensitive Plants and Animals)**

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

**Rangeland Health Assessment**

**Plants**

There are no known BLM sensitive plants within the allotment. In the Jarbidge Field Office special status plants are generally associated with distinct soil types that occur on scattered portions of the field office. None of these soil types occur within the allotment based on SSURGO soil data (NRCS, 2012). Potential habitat occurs for one sensitive plant species, slickspot peppergrass (*Lepidium papilliferum*; Proposed Endangered, BLM sensitive species). Approximately 5,108 acres have been surveyed for slickspot peppergrass; slickspots were noted but slickspot peppergrass plants have not been found in these or previous surveys. Systematic inventories for other special status plants have not been conducted in the allotment. No special status plant species have been recorded during other monitoring efforts (e.g., slickspot

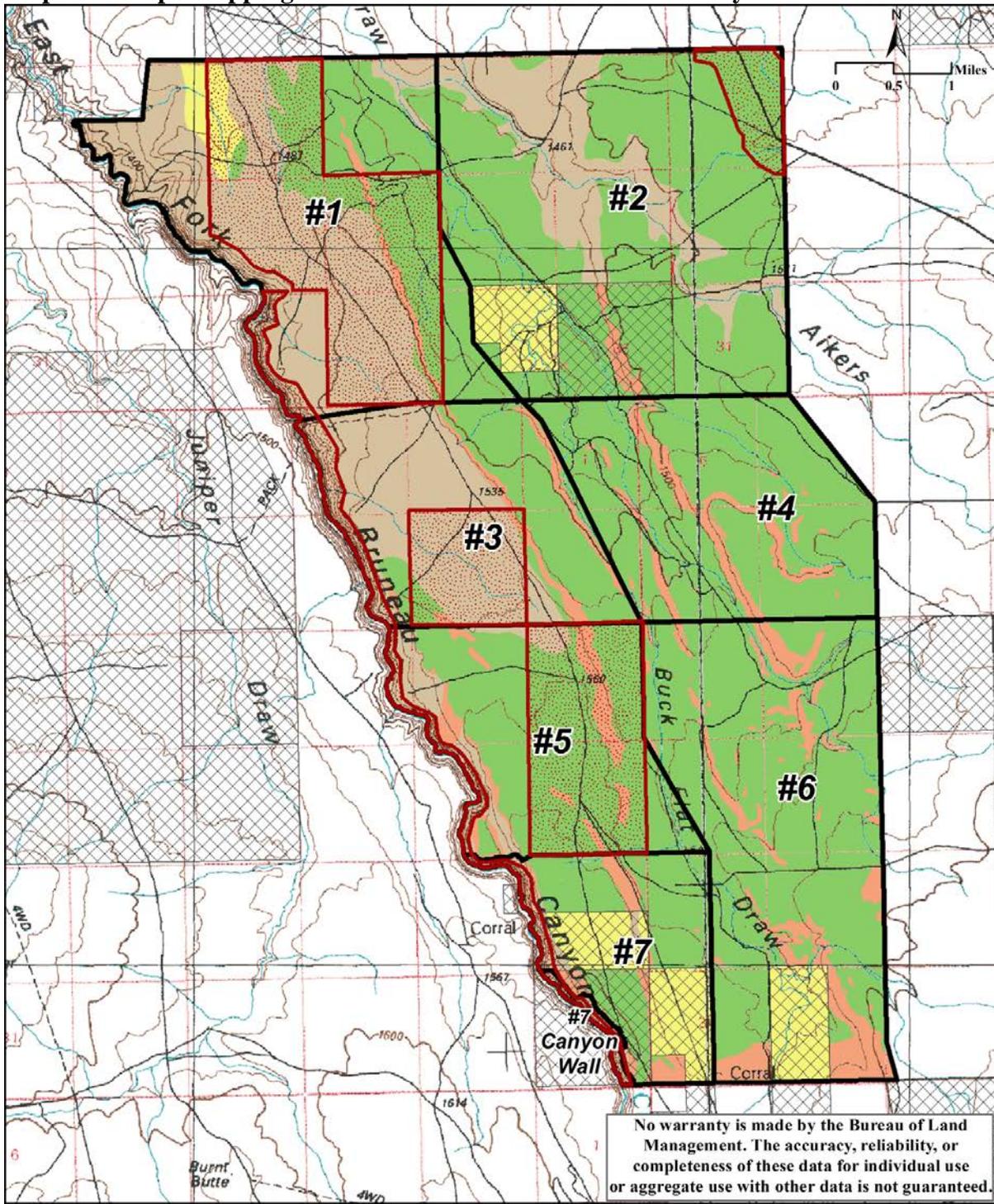
peppergrass inventories, IIRH field visits, sage-grouse habitat assessments, fire rehabilitation monitoring, etc.).

Slickspot peppergrass grows in the semiarid sagebrush-steppe ecosystem of southwestern Idaho. Interspersed within this habitat type, slickspot peppergrass can be found in visually distinct microsites known as slickspots (mini playas or natric sites) that act as small water basins and where the sodium and clay content is higher than adjacent, unoccupied habitat (Moseley, 1994). The Buck Flat AMP Allotment contains 15,981 acres (73% of allotment) of slickspot peppergrass habitat (Map 8). A GIS model was developed to help focus inventory and clearance efforts to areas that would have a higher probability of finding slickspot peppergrass plants (BLM, 2012). This model used updated soils data, vegetation community data, fire frequency, slope, and elevation to further refine potential habitat and to categorize it into groups (high, medium, low, non-habitat) that identify the potential for finding the species. The allotment contains 14,126 acres of high potential, 1,606 acres of medium potential, 213 acres of low potential, and 5,957 acres of non-habitat for slickspot peppergrass (Table 30). The nearest known occupied habitat for slickspot peppergrass is 0.1 mile to the west, on the west side of Clover Creek.

**Table 30: Slickspot Peppergrass Potential Habitat (Acres)**

Pasture	High	Medium	Low	Non-habitat
1	1,580	90	209	2,634
2	3,281	1	1	1,234
3	827	193	0	1,622
4	2,583	315	0	0
5	1,897	242	0	402
6	3,389	664	1	0
7	606	99	1	65

**Map 8: Slickspot Peppergrass Potential Habitat and Areas Surveyed**



## Animals

Presence of various sensitive wildlife species are based upon primarily incidental observations by BLM personnel and data entered into the Idaho Natural Heritage Center database by other individuals. Species found on the Buck Flat AMP Allotment are discussed below.

### **Redband Trout (*Oncorhynchus mykiss gairdnerii*; BLM sensitive species)**

Redband trout are known to occur within the Clover Creek drainage on the western edge of Pastures 1, 3, 5, and 7. No recent fisheries surveys have occurred in the allotment, but redband trout likely inhabit Clover Creek within the allotment when water temperature is suitable (October – June). Fish habitat surveys have also not been conducted within the allotment. No other BLM Sensitive fish or threatened, endangered, or special status aquatic species are present in the allotment.

### **Greater Sage-Grouse (*Centrocercus urophasianus*; BLM sensitive species)**

Sage-grouse require sagebrush and other shrub habitat to fulfill seasonal habitat needs (Connelly et al., 2000; Holloran et al., 2005). Sage-grouse are dependent on sagebrush ecosystems and require extensive stands of sagebrush with a diverse and vigorous herbaceous understory.

Sage-grouse display and breed on leks (i.e., display grounds with sparse vegetation cover) between March and May. After breeding hens disperse into nesting areas around the leks. Approximately 75 percent of sage-grouse hens nest within 4 miles of a lek (Holloran and Anderson, 2005; Holloran et al., 2007). Sage-grouse typically return to the same lek and nest areas year after year. Hens seek out nest sites that are concealed from predators (especially avian). (Conover et al., 2010) by a combination of sagebrush and grass cover. When chicks hatch the hen and her chicks feed on insects and forbs; slowly moving towards wetter areas like wet meadows or streams and springs where forbs are still green and growing. A diverse forb component and an abundance of forbs are necessary to support a variety of insects which are critical to the growth of young sage-grouse (Knick and Connelly, 2011). In the fall, as forbs dry up, sage-grouse switch from eating forbs to sagebrush through the winter. Sage-grouse may either migrate to different seasonal habitats or may remain in a single general area throughout the year.

In 2010, BLM developed the Sage-Grouse HAF to assess seasonal sage-grouse habitats at multiple scales (Stiver et al., 2010). Habitat suitability requirements were based on the following guidelines which were published in 2000 and describe desired conditions for sage-grouse habitats during nesting and early brood rearing, late brood rearing, and winter:

- Nesting and early brood rearing habitat should support 15-25 percent canopy cover of sagebrush, perennial herbaceous cover should average at least 7” in height with at least 10 percent canopy cover for grasses and at least 5 percent for forbs and a diversity of forb species during spring (Connelly et al., 2000).
- Late brood rearing habitat should support 10-25 percent canopy cover of sagebrush. Riparian areas or wet meadows in the general area improve habitat for sage-grouse (Connelly et al., 2000).

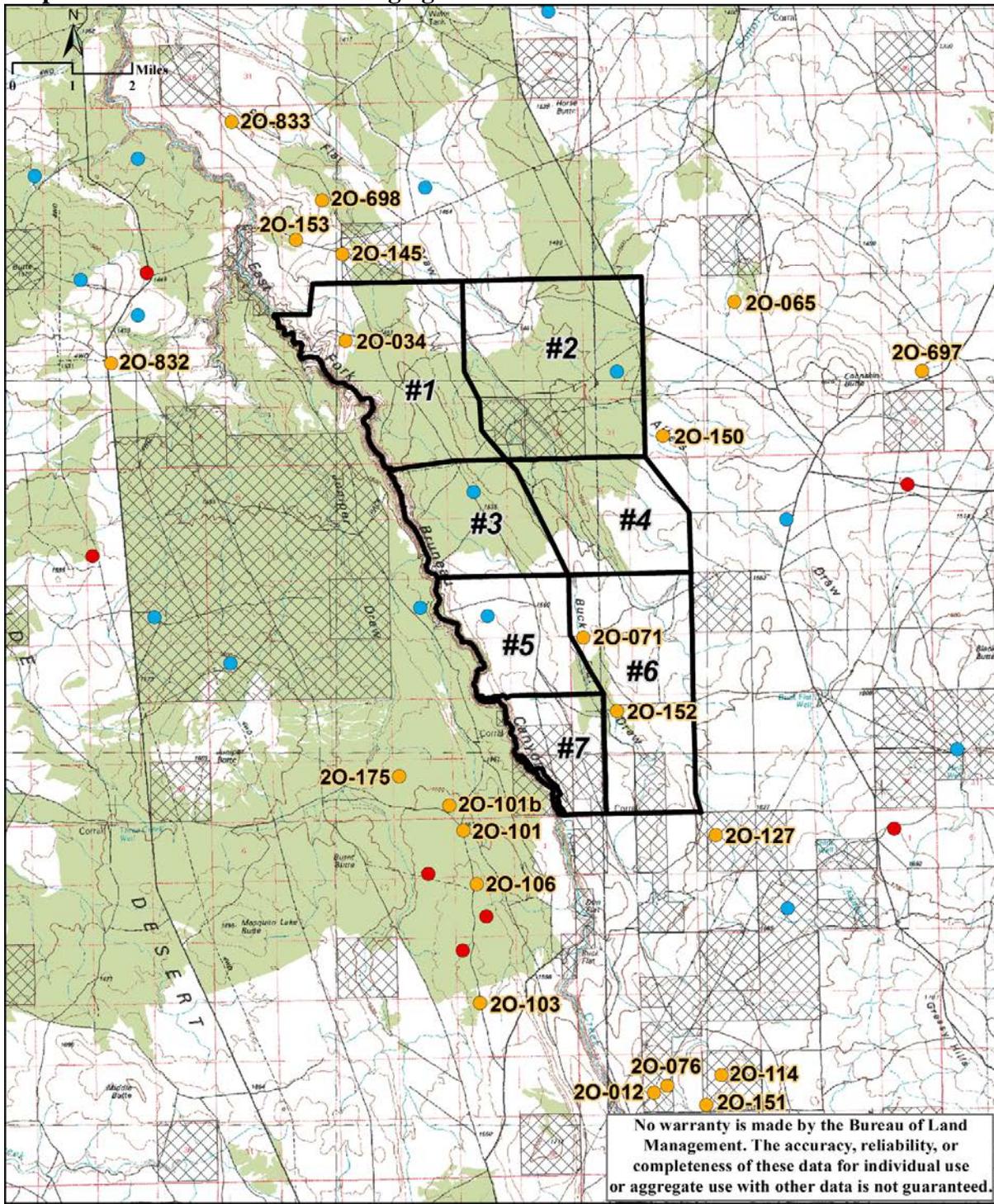
- Winter habitat should have 10-30 percent canopy cover of sagebrush with at least 10-14' exposed above the snow (Connelly et al., 2000).

Based on vegetation mapping from 2013, the Buck Flat AMP Allotment contains 8,528 acres mapped as sagebrush (39% of the allotment). Sagebrush occurs in the following pastures: Pasture 1 (1,685 acres, 37% of pasture), Pasture 2 (3,496 acres, 77% of pasture), Pasture 3 (1,543 acres, 58% of pasture), Pasture 4 (1,328 acres, 46% of pasture), Pasture 5 (138 acres, 5% of pasture), Pasture 6 (207 acres, 5% of pasture), and Pasture 7 (130 acres, 17% of pasture).

The Murphy Complex Fires of 2007 eliminated the majority of sagebrush in Pastures #5, #6, and #7 and the southern portions of Pastures 3 and 4. These pastures were aerial seeded with sagebrush in strips following the fires. The Horse Butte 2 Fire of 2013 burned the northeast corner of Pasture #1 and the northwest corner of Pasture #2. The entire burned area was aerially seeded to sagebrush. Where sagebrush has been reseeded, recovery of the sagebrush community needed for sage-grouse is expected to take one (Wambolt and Payne, 1986) to several (Baker, 2006; Baker, 2011) decades assuming the absence of additional fire. Sagebrush seedlings were observed at every site visited during the IIRH field visits. The low density and small size of sagebrush makes the area where the fire burned currently unsuitable for sage-grouse but the area is recovering.

Sage-grouse have been observed in the adjoining allotments year round. Sage-grouse habitat extends from the Buck Flat AMP Allotment into the Horse Butte, Juniper Butte, Juniper Draw and Juniper Ranch Allotments (Map 9).

**Map 9: Shrubland Habitat and Sage-grouse Leks**



Buck Flat AMP Allotment & Pastures	Shrubland	<b>Management Status</b>
Non-BLM Land		Occupied
		Undetermined
		Unoccupied

The Buck Flat AMP Allotment contains 3 occupied and 3 undetermined (due to a lack of recent surveys) sage-grouse leks. Within five miles there are 21 occupied, 15 undetermined, and 7 unoccupied sage-grouse leks (Table 31). Leks are considered occupied if there has been documented sage-grouse activity within the past five years.

**Table 31: Sage-grouse Attendance at Occupied Leks within Five Miles of the Buck Flat AMP Allotment, 2000-2014**

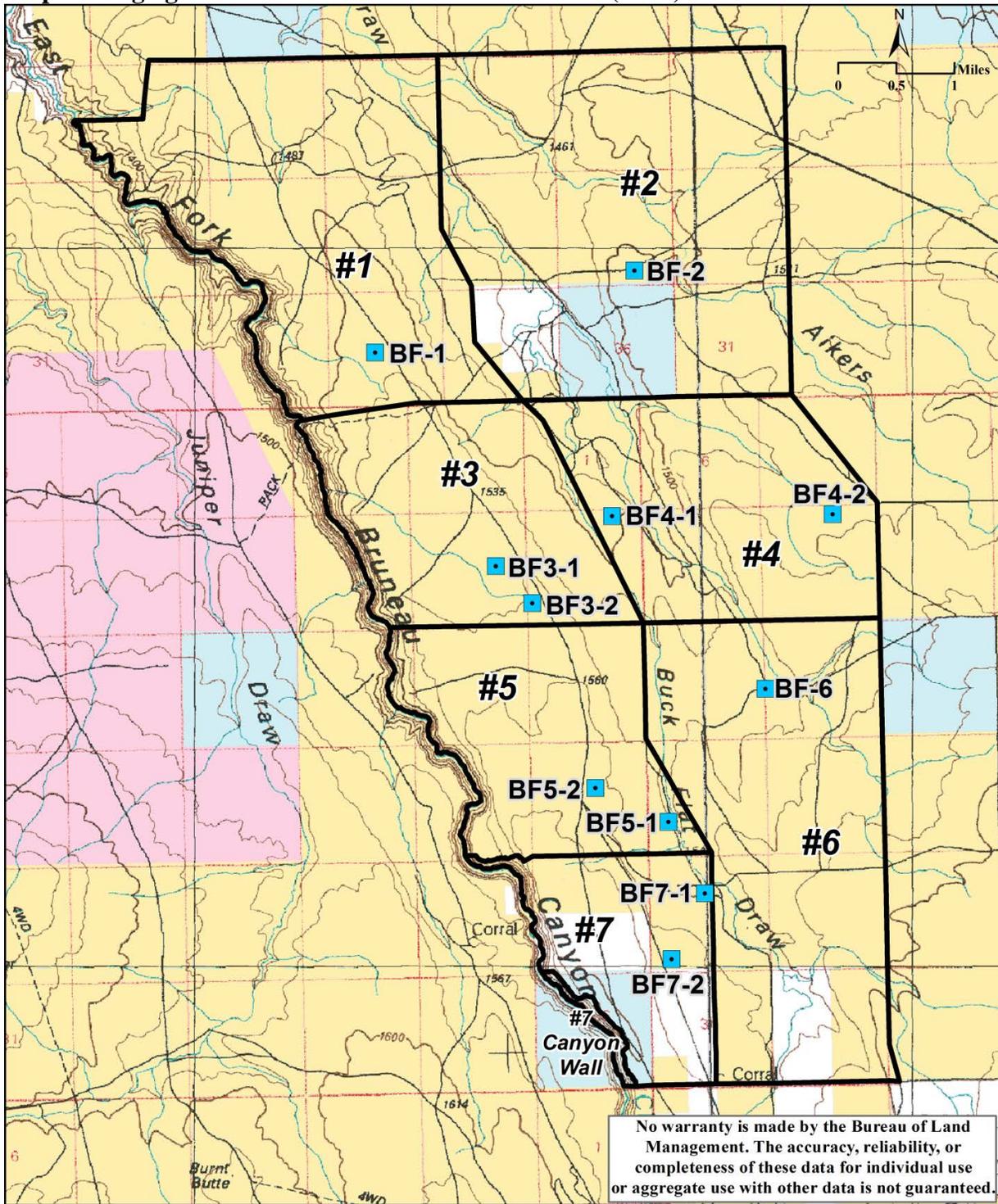
Lek	Location	Survey Year <sup>1</sup>														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
2O-034	Pasture 1						1	--	8	--	--	3	--	0	--	--
2O-071	Pasture 6										12	4	--	--	--	--
2O-152	Pasture 6	--	--	--	--	0	--	--	--*	--	--	0	11	0	--	--
2O-150	0.3 mile E						19	--	7*	15	7	6	0	--	--	--
2O-127	0.5 mile SE										6	3	--	--	--	--
2O-145	0.5 mile N	22	21	6	--	24	32	10	33	25	19	22	0	22	19	33
2O-153	0.7 mile N										3	12	--	--	0	0
2O-101b	1.4 mile W						6	12	10	6	--	6	0	1	0	4
2O-698	1.4 mile N								7	--	--	3	0	0	--	--
2O-065	1.6 mile E										12	5	--	--	--	--
2O-101	1.6 mile W	9	0	0	--	6	6	24	7	2	7	2	0	4	3	4
2O-106	1.8 mile SW	13	11	--	--	12	26	22	3	5	7	2	4	2	0	4
2O-175	2.0 miles W							34	1	12	5	15	32	35	19	81
2O-832	2.8 miles W											3	7	19	12	25
2O-833	3.0 miles N													9	--	19
															*	
2O-103	3.4 miles SW	6	0	16	--	15	24	18	15	8	4	9	5	1	5	9
2O-114	4.4 miles S										4	5	--	--	--	--
2O-076	4.6 miles S	--	--	--	--	--	--	--	--*	--	--	5	--	--	--	--
2O-012	4.7 miles S										8	--	12	--	--	--
2O-697	4.7 miles E								2*	0	0	4	1	4	0	0
2O-151	4.9 miles S	--	--	--	--	--	13	--	--*	8	3	3	0	6	--	5

<sup>1</sup>Where the table is blank the lek had not yet been identified; in years marked by dashes (--) the lek was not surveyed. An asterisk indicates area around lek burned in a wildfire that year (\*).

#### *Nesting and Early Brood Rearing Habitat*

The current conditions of sage-grouse seasonal habitats were assessed following protocols outlined in the Sage-grouse Habitat Assessment Framework (Stiver et al., 2010). Sage-grouse habitat suitability assessments were conducted in 2013. Assessments were conducted at eleven HAF sites in the allotment including: **BF1-** Pasture 1, **BF2-** Pasture 2, **BF3\_1** and **BF3\_2-** Pasture 3, **BF4\_1** and **BF4\_2-** Pasture 4, **BF5\_1** and **BF5\_2-** Pasture 5, **BF6-** Pasture 6, and **BF7\_1** and **BF7\_2-** Pasture 7 (Map 10).

**Map 10: Sage-grouse Habitat Assessment Framework (HAF) Sites**



Sage-grouse droppings were observed during the assessments in Pasture #1, Pasture #2, Pasture 3 (sites 1 and 2), and Pasture 4 (site 1); however, no sign was observed in the other pastures. Sage-grouse habitat suitability assessments are not necessarily an indication of rangeland health; they are merely indicators of habitat suitability. However, vegetation data collected as part of the habitat suitability assessments may be used to inform and interpret other rangeland health information and observations. Sage-grouse habitat suitability assessments are shown in Table 32.

**Table 32: Sage-grouse Habitat Assessment Worksheet for Nesting and Early Brood Rearing Habitat (Arid Site)**

Habitat Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
	<b>15 – 25%</b>	<b>10 - &lt; 15% or &gt; 25%</b>	<b>&lt; 10%</b>
Average Sagebrush Canopy Cover	BF1 (16%), BF2(22%), BF3_1(32%)	BF4_1(33%), BF5_1(14%), BF7_1(29%)	BF3_2(0%), BF5_2(0%), BF4_2 (4% sagebrush and 8% rabbitbrush) BF6(1%), BF7_2(0%)
	<b>12 - 30"</b>	<b>10 -11" or &gt;30"</b>	<b>&lt; 10"</b>
Average Sagebrush Height	BF1(30"), BF2(30"), BF3_1(24"), BF4_1(26"), BF4_2(24"), BF5_1(23"), BF6(22"), BF7_1(28")		BF3_2(0"), BF5_2(0"), BF7_2(0")
	<b>Spreading</b>	<b>Mix of spreading and columnar</b>	<b>Columnar</b>
Sagebrush Growth Form	BF1, BF2, BF3_1, BF4_1, BF4_2, BF5_1, BF6, BF7_1		BF3_2, BF5_2, BF7_2
	<b>≥ 7"</b>	<b>5 - &lt; 7"</b>	<b>&lt; 5"</b>
Average Grass Height		BF4_2(5.0")	BF1(1.9"), BF2(3.6"), BF3_1(3.5"), BF3_2(2.4"), BF4_1(2.1"), BF5_1(2.2"), BF5_2(4.2"), BF6(4.4"), BF7_1(1.8"), BF7_2(3.6")
	<b>≥ 10%</b>	<b>5 - &lt; 10%</b>	<b>&lt; 5%</b>
Average Perennial Grass Canopy Cover	BF1(28%), BF2(26%), BF3_1(30%), BF3_2(28%), BF4_1(33%), BF4_2(42%), BF5_1(32%), BF5_2(30%), BF6(42%), BF7_1(29%), BF7_2(36%)		
	<b>≥ 5%</b>	<b>3 - &lt; 5%</b>	<b>&lt; 3%</b>
Average Forb Canopy Cover	BF3_2(5%), BF4_2(5%), BF5_2(12%), BF6(10%)	BF2(4%)	BF1(1%), BF3_1(2%), BF4_1(0%), BF5_1(2%), BF7_1(1%), BF7_2(3%)

Habitat Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
Preferred Forb Abundance and Diversity	<b>Forbs common with at least a few preferred species common</b>	<b>Forbs common, but only 1 or 2 preferred species present</b>	<b>Forbs rare to sparsely present</b>
	BF1, BF3_1, BF3_2, BF4_2, BF5_1, BF5_2, BF6, BF7_2	BF2, BF4_1, BF7_1	
<b>Overall Site Evaluation</b>		<b>BF1, BF2, BF3_1, BF4_1, BF5_1, BF7_1</b>	<b>BF3_2, BF4_2, BF5_2, BF6, BF7_2</b>
<b>Pasture Evaluation</b>		<b>Pasture 1, Pasture 2, Pasture 3, Pasture 4</b>	<b>Pasture 5, Pasture 6, Pasture 7</b>

Pasture #1 contained one HAF site. HAF site BF1 is located in an area mapped as a rabbitbrush/Sandberg bluegrass vegetation community. Attributes at this site were rated suitable for all habitat indicators except for average grass height (unsuitable) and average forb canopy cover (unsuitable). Although average forb canopy cover was unsuitable, the site was rated suitable for preferred forb abundance and diversity with 7 species of forbs observed. The most common species included longleaf phlox and sagebrush phlox both sage-grouse preferred forbs. Cheatgrass was measured at 10 percent cover at the site (all layers). Over time cheatgrass will limit native perennial and annual forbs and increase fine fuels making wildfires more likely. Additionally, the deep-rooted perennial grass component of the site has been reduced, and while Sandberg bluegrass can provide cover for sage-grouse, it is less consistent and less dense than the typical tall statured bunchgrasses. Pasture #1 was rated marginal as habitat for sage-grouse since the majority of the habitat indicators were rated suitable with the exception of low grass height, average forb canopy cover, and the presence of cheatgrass.

One HAF site is located in Pasture #2. HAF site BF2 is located in an area mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. Habitat indicators that were rated suitable include sagebrush height, sagebrush growth form, and perennial grass canopy cover with the remaining indicators all being rated marginal or unsuitable. Five forb species were observed with the only common forb species being longleaf phlox. Cheatgrass was measured at 7 percent cover at the site (all layers). Average grass height was only 3.6 inches but there are several grass species present on the site. Pasture #2 provides marginal habitat for sage-grouse.

Two HAF sites are located in Pasture #3. HAF site BF3\_1 is in an area mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. The other HAF site, BF3\_2 is in an area mapped as a Sandberg bluegrass vegetation community in the southern end of the pasture that burned in 2007. Attributes at HAF site BF3\_1 were rated suitable for all habitat indicators except for sagebrush canopy cover (marginal), average grass height (unsuitable), and average forb canopy cover (unsuitable). Nine species of forbs were observed with the most common being longleaf phlox, sagebrush phlox, and spiny phlox. HAF site BF3\_2 did not contain sagebrush along the transect; however, islands of sagebrush seedlings were observed at the site. The absence of adequate sagebrush was expected since the area burned in 2007 and shrubs have yet to fully reestablish. Forb habitat indicators were rated suitable at the site. Eight forb species were observed with the most common species being sagebrush phlox, longleaf phlox, pale

agosaris, and shaggy fleabane (*Erigeron pumilus*) all sage-grouse preferred forbs. Cheatgrass was measured at 0 percent cover at HAF site BF3\_1 and 7 percent cover at HAF site BF3\_2 (all layers). Average perennial grass height was rated unsuitable at both sites with deep-rooted perennial grasses being fairly uncommon (2% cover). Pasture #3 provides marginal habitat for sage-grouse. The majority of the pasture contains sagebrush and the southern end of the pasture that burned in 2007 contains islands of sagebrush seedlings.

Pasture #4 contains two HAF sites. HAF site BF4\_1 is in an area mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. The other HAF site, BF4\_2 is in an area mapped as a Sandberg bluegrass vegetation community on the eastern side of the pasture that burned in 2007. Attributes at HAF site BF4\_1 were rated suitable for sagebrush height, growth form, and perennial grass canopy cover. Sagebrush cover and preferred forb abundance and diversity were rated marginal and average grass height and forb canopy cover were rated unsuitable. Thirteen species of forbs were observed with the only common forbs being sagebrush phlox and longleaf phlox. Additionally no deep-rooted perennial grasses were detected in the cover transects and Sandberg bluegrass dominates the understory. Attributes at HAF site BF4\_2 were rated suitable for all habitat indicators except for sagebrush canopy cover (unsuitable) and average perennial grass height (unsuitable). Eight species of forbs were observed with common species being sagebrush phlox and pale agoseris. Additionally 5 species of perennial grasses are present on the site although Sandberg bluegrass is still the dominant grass species by cover. Cheatgrass was not observed during the walk around or along the transect at HAF site BF4\_1. Cheatgrass was recorded at 19 percent cover at HAF site BF4\_2 (all layers) with cheatgrass occurring mainly in scattered, dense patches. Pasture #4 provides marginal habitat for sage-grouse.

Pasture #5 contains two HAF sites. The vast majority of the pasture burned in 2007 with the exception of a sagebrush island that is located at the intersection of Pastures #5, #6, and #7. HAF site BF5\_1 is located in the sagebrush island which is mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. The other HAF site, BF5\_2 is located in an area mapped as a Sandberg bluegrass vegetation community which represents the majority of the pasture. Attributes at HAF site BF5\_1 were rated suitable for all habitat indicators except for sagebrush canopy cover (marginal), average grass height (unsuitable), and average forb canopy cover (unsuitable). Although average forb canopy cover was unsuitable, the site was rated suitable for preferred forb abundance and diversity with 8 species of forbs observed. The most common species included longleaf phlox and sagebrush phlox. Additionally there was only 1 percent deep-rooted perennial grass cover and Sandberg bluegrass dominates the understory on the site with 28 percent cover (all layers). Attributes at HAF site BF5\_2 were rated unsuitable for sagebrush indicators, marginal for grass height, and suitable for grass canopy cover, average forb canopy cover, and preferred forb abundance and diversity. Eleven species of forbs were observed with the most common being sagebrush phlox, longleaf phlox, and pale agoseris. Bluebunch wheatgrass was present on the site with 5 percent cover while Sandberg bluegrass was abundant with 25 percent cover. Cheatgrass was measured at 1 percent cover at HAF site BF5\_1 and 6 percent cover at HAF site BF5\_2 (all layers). Wildfire has eliminated the majority of sagebrush in Pasture #5 making it unsuitable for sage-grouse.

The majority of Pasture #6 also burned in 2007. One HAF site BF6 was conducted in the northern portion of the pasture in an area mapped as a Sandberg bluegrass vegetation community. This represents the majority of the pasture. All habitat indicators were rated suitable except for sagebrush canopy cover (1%, unsuitable rating) and average grass height (unsuitable). Six species of forbs were observed with the most common being sagebrush phlox and pale agoseris. Five species of perennial grasses were present with Sandberg bluegrass being the most common with 30 percent cover. Cheatgrass was measured at 4 percent (all layers). The site has moderate restoration potential. Without sagebrush of sufficient density for nesting, Pasture #6 was rated unsuitable for sage-grouse.

Pasture #7 also burned in 2007. Two HAF sites were conducted in the pasture. HAF site BF7\_1 was conducted in the sagebrush island at the intersection of Pastures #5, #6, and #7. This site is mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. The other HAF site, BF7\_2 is located in an area mapped as a Sandberg bluegrass vegetation community which represents the majority of the pasture. Attributes at HAF site BF7\_1 were rated suitable for sagebrush height, sagebrush growth form, and perennial grass canopy cover. Sagebrush canopy cover and preferred forb abundance and diversity were rated marginal and average grass height and forb canopy cover were rated unsuitable. Seven species of forbs were observed with the most common being sagebrush phlox, longleaf phlox, and pale agoseris. Additionally no deep-rooted perennial grasses were detected in the cover transects and Sandberg bluegrass dominates the understory with 28 percent cover (all layers). Attributes at HAF site BF7\_2 were rated unsuitable for all habitat indicators except for perennial grass canopy cover (suitable) and preferred forb abundance and diversity (suitable). Twelve species of forbs were observed with the most common being sagebrush phlox, longleaf phlox, and pale agoseris. Bluebunch wheatgrass and Sandberg bluegrass was present with 15 percent and 17 percent cover, respectively. The forb and deep-rooted perennial grass species that are present on this site and the lack of cheatgrass suggest that it would be a good choice for active sagebrush restoration. No cheatgrass was observed along the transects at HAF sites BF7\_1 or BF7\_2. Wildfire has eliminated the majority of sagebrush in Pasture #7 making it unsuitable for sage-grouse.

A list of plant species observed at each site, including preferred sage-grouse forbs is included in Appendix A.

#### *Late Brood Rearing Habitat*

Aikers Draw passes through Pastures 1 and 2 and portions of Buck Flat Draw intersect each pasture in the allotment. These draws contain water intermittently and livestock ponds were constructed along these draws to capture water from snowmelt. One pond is located along Aikers Draw in Pasture #2 and is 0.6 acres in size and in some years may contain water until late June. Another pond is located along Buck Flat Draw in Pasture #3 and is 0.5 acre in size. Another pond that is augmented by water in the pipeline is located along Buck Flat Draw between Pastures 6 and 7 (0.7 acres in size). The pond generally contains water until mid-July which concentrates livestock in the only area mapped as sagebrush in the pastures. Areas along the drainage and around the ponds provide limited brood rearing habitat for sage-grouse. In some years these areas contain a higher abundance of preferred forbs than the surrounding uplands while in other years the drainages are dry. Clover Creek along the western edge of the allotment occurs in the bottom of a steep canyon. Riparian areas associated with steep drainages

or canyons are not used by sage-grouse (Stiver et al., 2010). Overall, Pastures #1, #2, #3, and #4 contain limited potential brood rearing habitat and were rated as marginal. Buck Flat Draw is also present in Pastures #5, #6, and #7; however, sagebrush cover is absent along much of the draw in these pastures making them unsuitable as late brood rearing habitat.

#### *Winter Habitat*

Pastures #1, #2, #3, and #4 contain shrub height (24 to 30 inches) and cover (16-35%) that is suitable for wintering sage-grouse. During winter snow depths are usually less than 12 inches leaving most sagebrush above the snow and available for wintering sage-grouse.

Pastures #5, #6, and #7 are unsuitable for wintering sage-grouse since sagebrush of adequate size and density is largely absent. The only area in these pastures that contains sagebrush of suitable height (23 to 28 inches) and cover (15-31%) for wintering sage-grouse occurs where Pastures #5, #6, and #7 intersect. This area of sagebrush is 475 acres in size (138 acres in Pasture #5, 207 acres in Pasture #6, and 130 acres in Pasture #7).

#### **Ferruginous Hawk (*Buteo regalis*; BLM sensitive species)**

Ferruginous hawks typically inhabit flat and rolling terrain in grasslands and shrub-steppe regions (Bechard and Schmutz, 1995). They primarily nest in trees or less frequently on cliffs, rock outcrops or on the ground at the crest of ridges. Although ferruginous hawks exhibit flexibility in nest site selection, they prefer elevated nest sites and rarely nest on level ground (Bechard and Schmutz, 1995). Ferruginous hawks may have more than one nest site within their nesting territory that they may use in different years (Bechard and Schmutz, 1995). Locally, ferruginous hawks that nest on the ground are rarely successful. Both the male and female share in the nest selection, egg incubation and young rearing, though the male does most of the hunting. One clutch of 2-4 eggs is laid in spring and parents care for the young until several weeks after fledging (Bechard and Schmutz, 1995).

Ferruginous hawk prey primarily on smaller mammals. Prey species include ground squirrel (*Urocitellus* spp.), black-tailed jackrabbit (*Lepus californicus*), mountain cottontail (*Sylvilagus nuttalli*), and pocket gopher (*Thomomys talpoides*). Fledgling birds, reptiles and insects constitute a small percent of the diet (Bechard and Schmutz, 1995).

Management of shrub-steppe and grassland habitats that provide healthy native shrub and bunchgrass communities and a natural range of habitat variation would be expected to provide suitable habitat for ferruginous hawks.

There are no known ferruginous hawk nests in the allotment. However, there is a nest 1.2 mile to the west and another nest 1.7 mile to the east. Ferruginous hawks from these nesting territories likely hunt in the Buck Flat AMP Allotment.

At this time no trees are found in the uplands of the allotment that could be use by ferruginous hawks for nesting. Junipers occur in the canyon along Clover Creek bordering the eastern side of Pastures 1, 3, 5, and 7. Pastures #1, #2, #3, and #4 contain large areas of sagebrush steppe which provide suitable habitat for mammalian prey (black-tailed jackrabbit, mountain cottontail, ground squirrels, etc.) favored by ferruginous hawks. Jackrabbits in southwestern Idaho are

found in areas with shrubs more often than in burned areas that lack shrubs (Knick and Dyer, 1997). Pastures #5, #6, and #7 are dominated by perennial grasslands that provide marginal habitat for prey species.

**Brewer's Sparrow (*Spizella breweri*; BLM sensitive species)**

Brewer's sparrows are typically associated with sagebrush steppe. Brewer's sparrow place nests primarily in shrubs, but occasionally on the ground. The nest shrub is typically taller and denser than in the surrounding habitat (Rotenberry et al., 1999). Shrubs used for nesting by Brewer's sparrows include primarily big sagebrush (81%), with spiny hopsage (*Grayia spinosa*) (10%), antelope bitterbrush (*Purshia tridentata*) (6%), and rabbitbrush (3%) (Rotenberry et al., 1999). Brewer's sparrows construct their nest in the canopy of sagebrush which averaged 27 inches tall (Rotenberry et al., 1999). In Idaho, Brewer's sparrow nests ranged from 7.8 to 19.6 inches above the ground, averaged 9 inches from the top of the sagebrush and averaged 7 inches from the edge of the shrub canopy (Rotenberry et al., 1999). These sparrows feed on small insects and seeds (Rotenberry et al., 1999).

Management and conservation of habitat to provide suitable sage-grouse habitat would also benefit Brewer's sparrow (Rowland et al., 2006). Brewer's sparrows have been observed and are expected to be common in sagebrush habitats within the Buck Flat AMP Allotment. At this time shrub height and density are suitable for Brewer's sparrow nesting in Pastures #1, #2, #3, and #4.

Pastures #5, #6, and #7 are dominated by perennial grasslands that are unsuitable for nesting. The only area in these pastures that contains sagebrush of suitable height and cover for nesting occurs where Pastures #5, #6, and #7 intersect (475 acres).

**Loggerhead shrike (*Lanius ludovicianus*; BLM sensitive species)**

Loggerhead shrikes are associated with open grasslands and shrub-steppe habitats. In southern Idaho loggerhead shrikes place nests in big sagebrush, antelope bitterbrush and greasewood (Woods and Cade, 1996). Nest shrubs ranged from 35 to 117 inches tall (Woods and Cade, 1996). The average height of the nest was 31 inches and ranged from 13 to 63 inches above ground (Woods and Cade, 1996). Although big sagebrush was shorter than greasewood or bitterbrush nest height was similar for all shrubs (Woods and Cade, 1996). In the Jarbidge Field Office a few loggerhead shrike nests have been found in western juniper.

Loggerhead shrikes feed on arthropods, amphibians, reptiles, small mammals and birds (Yosef, 1996). They use thorny bushes or barbed wire fences to impale their prey to facilitate feeding and to store future meals.

Management of shrub-steppe habitat that provides healthy native shrub and bunchgrass communities and a natural range of habitat variation would be expected to provide suitable habitat for loggerhead shrikes.

Loggerhead shrikes have been observed on the allotment. Nesting habitat for loggerhead shrikes is limited to areas containing sagebrush. Sagebrush of suitable height for nesting occurs in Pastures #1, #2, #3, and #4. Pastures #5, #6, and #7 are dominated by perennial grasslands that

are unsuitable for nesting. The only area in these pastures that contains sagebrush of suitable height and cover for nesting occurs where Pastures #5, #6, and #7 intersect.

**Sagebrush sparrow (*Artemisiospiza nevadensis*; BLM sensitive species)**

Sagebrush sparrows are sagebrush obligates that are typically common in shrub-steppe habitats (Martin and Carlson, 1998). Sagebrush sparrow nest in shrubs, in bunchgrasses or occasionally on the ground at the base of a shrub (Martin and Carlson, 1998). The nest shrub is usually taller than the surrounding vegetation (Martin and Carlson, 1998). In Idaho sagebrush sparrows nest in big sagebrush, however, in Oregon they may also use antelope bitterbrush, rabbitbrush, greasewood (*Sarcobatus vermiculatus*) and bunchgrasses (Martin and Carlson, 1998). In general sagebrush sparrow nests are placed closer to the main stem than the edge of the shrub. In shrubs the nest can range from 9 to 11 inches above the ground. Sagebrush sparrows feed on seeds, insects, spiders, fruits, and succulent vegetation (Martin and Carlson, 1998).

Management and conservation that provides suitable sage-grouse habitat would also benefit sagebrush sparrow (Rowland et al., 2006). Sagebrush sparrows have been observed and are expected to be common in Pastures #1, #2, #3, and #4. Pastures #5, #6, and #7 are dominated by perennial grasslands that are unsuitable for nesting.

**Pygmy rabbit (*Brachylagus idahoensis*; BLM sensitive species)**

Pygmy rabbits are sagebrush obligates that are usually found in areas with tall dense stands of big sagebrush and deep soils (Green and Flinders, 1980; Heady and Laundré, 2005). Pygmy rabbits usually excavate burrow systems with multiple entrances. Burrow entrances are often at the base of sagebrush (Green and Flinders, 1980). Pygmy rabbits spend most of their time (68%) in a generally small area (less than 200 feet radius [3 acres]) from the burrow within a larger (90 acres to 170 acres) home range. The primary food of pygmy rabbits is sagebrush which comprises 99 percent of its winter diet (Green and Flinders, 1980). Grasses and forbs make up more of the diet in the late spring into early summer.

Management and conservation of habitat to provide suitable sage-grouse habitat would also benefit pygmy rabbit (Rowland et al., 2006).

Approximately 120 acres along the east side of Pasture #2 was surveyed for pygmy rabbits in 2005. Old burrows were observed during the survey; however, no fresh sign was observed. The remainder of the allotment has not been surveyed for pygmy rabbits. Pygmy rabbits potentially occur in Pastures #1, #2, #3, and #4 since they have been observed in adjoining allotments to the north (Coonskin AMP, Horse Butte AMP, and Juniper Ranch Allotments). Areas of suitable habitat occur in Pastures #1, #2, #3, and #4. Pastures #5, #6, and #7 were rated unsuitable for pygmy rabbits because sagebrush of suitable density and height is largely absent.

**Piute ground squirrel (*Urocitellus mollis*; BLM sensitive species)**

Piute ground squirrels are associated with shrub-steppe habitats in southwestern Idaho. They emerge from hibernation in late February into March depending on the year and begin hibernation by late June (Yensen and Sherman, 2003). The diet of Piute ground squirrels is dominated by herbaceous vegetation including grasses and forbs, seeds, and animal matter

(Rickart, 1987; Yensen and Sherman, 2003). Piute ground squirrels excavate deep and shallow burrow systems (Reynolds and Wakkinen, 1987).

Piute ground squirrels are an important prey item to many predators in shrub-steppe habitats including other sensitive species like ferruginous hawks and prairie falcons.

Management of shrub-steppe habitat that provides healthy native shrub and bunchgrass communities and a natural range of habitat variation would be expected to provide suitable habitat for Piute ground squirrels.

Although Piute ground squirrels have been observed in the allotment, the BLM does not have distribution data on ground squirrels within the allotment. Sagebrush and grassland habitats in Pastures #1, #2, and #3 are suitable to maintain a relatively stable Piute ground squirrel population (Steenhof et al., 2006). Pasture #4 was rated marginal for Piute ground squirrels due to high amount of cheatgrass (19% cover for all layers) in the grassland portion of the allotment (site P4\_2). Because shrub habitats provide more favorable environments for ground squirrels than grass habitats (Yensen et al., 1992; Van Horne et al., 1997) Pastures #5, #6, and #7 were rated marginal for Piute ground squirrels.

**Spotted bat (*Euderma maculatum*; BLM sensitive species)**

Spotted bats are typically found in arid portions of the western United States where it forages primarily on moths (Adams, 2003). It roosts in rock crevices in tall cliffs. Little is known about the behavior and population size of spotted bats.

Roosting habitat for spotted bats is present in the canyon cliffs along Clover Creek Canyon on the western border of the allotment. Pastures #2, #4, and #6 do not contain cliffs for roosting. Spotted bats may forage over the allotment and drink and forage along Clover Creek. Spotted bats have been observed in Pasture #1 along Clover Creek.

**Evaluation for Standard 8**

There are no known BLM sensitive or federally listed plants within the Buck Flat AMP Allotment. Approximately 5,108 acres have been surveyed for slickspot peppergrass. However, systematic inventories for other special status plants have not been conducted in the allotment. GIS modeling predicts that the allotment contains 14,126 acres of high potential, 1,606 acres of medium potential, and 213 acres of low potential habitat for slickspot peppergrass. The nearest known occupied habitat for slickspot peppergrass is 0.1 mile to the west, on the west side of Clover Creek.

Redband trout are known to occur within the Clover Creek drainage on the western edge of Pastures #1, #3, #5, and #7 in the Buck Flat AMP Allotment. No recent fisheries surveys have occurred in the allotment, but redband trout likely inhabit Clover Creek within the allotment when water temperature is suitable (October – June). Fish habitat surveys have also not been conducted within the allotment. No other BLM sensitive fish or threatened, endangered, or special status aquatic species are present in the allotment.

Clover Creek within the allotment is listed by IDEQ as not supporting the beneficial uses of cold water aquatic life and salmonid spawning due to water temperature. During periods of the year when water temperature in Clover Creek exceed Idaho water temperature criteria for cold water aquatic life, Clover Creek within the allotment is not suitable habitat for redband trout. Riparian conditions within the allotment have improved which will result in increased shading of the stream by riparian vegetation. While improvement in riparian condition results in increased shading of the stream, Clover Creek is still not likely to meet IDEQ water temperature standards due to dewatering occurring upstream of the allotment.

Excess sediment was observed in all reaches of Clover Creek during the most recent PFC assessments. Excessive amounts of fine sediment can result in reduced spawning success and recruitment of salmonid species due to suffocation of incubating eggs. Appropriately sized substrate for salmonid spawning is present in the portions of the stream reaches in the allotment. Excess sediment may also negatively affect aquatic macroinvertebrates abundance. Aquatic macroinvertebrates are the primary food source of stream-dwelling salmonid species.

In the lowest reach of Clover Creek within the allotment (reach 35.5-36.4), the stream channel was determined to be over widened during the most recent PFC assessment. In the other four reaches of Clover Creek within the allotment, the width /depth ratio, gradient, and sinuosity were appropriate for the stream type. The physical habitat parameters (pool/riffle frequency, overhanging vegetation) within the allotment are generally suitable for adult and juvenile redband trout occupation.

Habitat for BLM sensitive wildlife species occurs within the allotment. Overall habitat ratings for each species by pasture are shown in Table 33.

**Table 33: Overall Habitat Suitability for BLM Sensitive Wildlife Species by Pasture**

Species Name and Type of Habitat	Pasture						
	#1	#2	#3	#4	#5	#6	#7
Sage-grouse (nesting & early brood rearing)	M	M	M	M	U	U	U
(late brood rearing)	M	M	M	M	U	U	U
(winter)	S	S	S	S	U	U	U
Ferruginous hawk (nesting)	U	U	U	U	U	U	U
(foraging)	S	S	S	S	M	M	M
Brewer's sparrow (nesting)	S	S	S	S	U	U	U
Sagebrush sparrow (nesting)	S	S	S	S	U	U	U
Loggerhead shrike (nesting)	S	S	S	S	U	U	U
Pygmy rabbit (year round)	S	S	S	S	U	U	U
Piute ground squirrel (year round)	S	S	S	M	M	M	M
Spotted bat (roosting)	S	U	S	U	S	U	S
(foraging)	S	S	S	S	S	S	S

S = Suitable (combination of components make the habitat suitable)

M = Marginal (some habitat components are missing)

U = Unsuitable (one or more critical habitat components are missing)

Overall, sage-grouse nesting and early brood rearing habitat is marginal in Pastures #1, #2, #3, and #4. Aikers and Buck Flat Draws offer limited late brood rearing habitat for sage-grouse in

the Pastures #1, #2, #3, and #4. Buck Flat Draw is also present in Pastures #5, #6, and #7; however, sagebrush cover is absent along much of the draw in these pastures making them unsuitable as late brood rearing habitat. Pastures #1, #2, #3, and #4 contain sagebrush of sufficient height and cover to provide suitable winter habitat for sage-grouse. Pastures #5, #6, and #7 are dominated by perennial grasslands that are unsuitable as wintering habitat.

Trees for ferruginous hawk nesting are absent in the uplands of the allotment. Habitat that supports prey species such as mountain cottontail, black-tailed jackrabbit and ground squirrels usually hunted by ferruginous hawk was rated suitable in Pastures #1-4 and marginal in Pastures #5-7.

Shrub height and cover is suitable for Brewer's sparrow, loggerhead shrike, and sagebrush sparrow nesting in Pastures #1, #2, #3, and #4. Pastures #5, #6, and #7 are generally unsuitable for nesting by these species. The only area in these pastures that contains sagebrush of suitable height and cover for nesting occurs where Pastures #5, #6, and #7 intersect.

Areas containing sagebrush of adequate height and density for pygmy rabbits were found in Pastures #1, #2, #3, and #4. Pastures #5, #6, and #7 burned in the 2007 Murphy Complex Fire and are dominated by perennial grasslands that do not provide habitat for pygmy rabbits.

Pastures #1, #2, and #3 contain suitable habitat to maintain a stable population of Piute ground squirrels due to adequate shrub and grass cover. Pastures #4, #5, #6, and #7 were rated marginal for Piute ground squirrels.

Spotted bat roosting habitat was rated suitable in the Pastures #1, #3, #5, and #7 due to cliffs along the western edge of the pastures. The allotment was rated suitable for spotted bat foraging due to its proximity to roosting habitat and the presence of grassland, sagebrush, and riparian habitats that support insects eaten by spotted bats. Clover Creek provides roosting, foraging, and watering locations for spotted bats within the allotment.

**Evaluation Finding – All Pastures (#1, #2, #3, #4, #5, #6, and #7) are:**

- Meeting the Standard
- Not meeting the Standard, but making significant progress towards meeting
- Not meeting the Standard

**Rationale for Evaluation Finding**

Clover Creek within Pastures #1, #3, #5 and #7 is listed by IDEQ as not supporting the beneficial uses of cold water aquatic life and salmonid spawning due to water temperature. Recruitment and spawning success are also likely reduced due to the excessive amount of fine sediment present in Clover Creek. Other adult and juvenile redband trout habitat requirements are likely met outside of the period when water temperatures exceed the preferred thermal range of redband trout. Due to the water temperature and sedimentation limitations, Clover Creek within Pastures #1, #3, #5 and #7 is not supporting a viable population of redband trout. Therefore, these pastures are not meeting Standard 8 for redband trout.

Pasture #1 contains sagebrush in the north central portion of the pasture and along the eastern side of the pasture (37% of the pasture contains sagebrush). Rabbitbrush is common throughout the pasture. Pasture #1 was rated marginal as habitat for sage-grouse during nesting and early brood rearing since the majority of the habitat indicators were rated suitable with the exception of low grass height, average forb canopy cover, and the presence of cheatgrass (10% cheatgrass cover for all layers). The deep-rooted perennial grass component of Pasture #1 has been reduced, and while Sandberg bluegrass can provide cover for sage-grouse, it is less consistent and less dense than the typical tall statured bunchgrasses. Data collected at trend site 12S10E22 indicates that Thurber's needlegrass has increased slightly and Sandberg bluegrass has nearly doubled between 1994 and 2013. During this same time frame, at trend site 12S10E34 the frequency of Thurber's needlegrass and squirreltail have declined while the frequency of Sandberg bluegrass has doubled. The frequency of cheatgrass declined at trend site 12S10E22 and increased at trend site 12S10E34. In IIRH field notes, cheatgrass was recorded as being common along the roads and disturbed areas but scattered further away from the road. Therefore, due to the amount of cheatgrass and the reduction in deep-rooted perennial bunchgrasses, Pasture #1 is not meeting Standard 8.

Adequate sagebrush is present in the majority of Pasture #2 for both breeding and wintering sage-grouse. However, other habitat parameters are generally not adequate; therefore, Pastures #2 was rated marginal for sage-grouse in regards to nesting and early and late-brood rearing requirements. At the HAF site in Pasture #2 average grass heights were below the recommended 7 inches and preferred forb species were present, but only 1 preferred species was common. Three species of deep or mid-rooted bunchgrasses were present on the site and they comprised 8 percent of the recorded cover. Additionally this site contains 7 percent cover of cheatgrass. Trend data from site 12S11E19 within Pasture #2 also indicate that Thurber's needlegrass and bottlebrush squirreltail have declined in portions of the pasture while cheatgrass and shallow-rooted Sandberg bluegrass have increased. At trend site 12S10E23 Thurber's needlegrass and Wyoming big sagebrush has remained static while western wheatgrass and cheatgrass have declined. Therefore, due to inadequate forbs, a reduction in deep and mid-rooted perennial grasses, and an increase of cheatgrass in portions of the pasture, Pasture #2 is not meeting Standard 8.

The majority of Pasture #3 contains sagebrush and the southern end of the pasture that burned in 2007 contains islands of sagebrush seedlings. Average perennial grass height was rated unsuitable at both HAF sites with deep-rooted perennial grasses being fairly uncommon (2% cover). Cheatgrass was recorded at 0 percent cover at HAF site BF3\_1 and at 7 percent cover at BF3\_2 (all layers). Numerous forb species were common at both HAF sites with some being sage-grouse preferred forbs. Overall, Pasture #3 was rated as marginal habitat for sage-grouse during nesting and early and late brood rearing. Due to a reduction in deep and mid-rooted perennial grasses and the presence of cheatgrass in portions of the pasture, Pasture #3 is not meeting Standard 8.

Pasture #4 contains sagebrush in the northeastern half of the pasture and the southeastern half burned in the Murphy Complex Fire of 2007. Adequate sagebrush is present in the northeastern half of Pasture #4 for both breeding and wintering sage-grouse. In the southeastern portion of the pasture sagebrush has been aerially seeded and is recovering; however sagebrush has not yet

achieved sufficient density for nesting. At both HAF sites in the pasture, average grass height was below the recommended 7 inches. At HAF site BF4\_1 in the western portion of the pasture that did not burn no deep-rooted perennial grasses were observed on the transects and forb density is somewhat low. No cheatgrass was observed at the site along the transect or during the walk around. At HAF site BF4\_2 in the eastern portion of the pasture that burned in 2007, rabbitbrush and sagebrush make up 12 percent cover, five species of perennial grasses are present, and forbs are fairly common. However, cheatgrass occurs at 19 percent cover along the transect in scattered, dense patches. In addition, the trend site 13S11E08 located in the eastern portion of the pasture near HAF site BF\_2 also indicates that cheatgrass has increased in portions of the pasture. Therefore, due to the amount of cheatgrass and low density sagebrush along the eastern portion of the pasture and a reduction in deep-rooted perennial bunchgrasses in the western portion of the pasture, Pasture #4 is not meeting Standard 8.

Sagebrush that is essential to maintain populations of sage-grouse and other sagebrush dependent species has been removed by wildfire across the majority of Pastures #5, #6 and #7. Although sagebrush seedlings were observed during field visits, recovery of the sagebrush community needed for sage-grouse and other sagebrush dependent species is expected to take one (Wambolt and Payne, 1986) to several (Baker, 2006; Baker, 2011) decades assuming the absence of additional fire. Therefore, Pastures #5, #6 and #7 are not meeting Standard 8.

## LITERATURE CITED

- Adams, R. A. (2003). *Bats of the Rocky Mountain West*. Bolder, CO: University Press of Colorado.
- Baker, W. L. (2006). Fire and Restoration of Sagebrush Ecosystems. *Wildlife Society Bulletin*, 34(1), 177-185.
- Baker, W. L. (2011). Chapter 11: Pre-Euro-American and Recent Fire in Sagebrush Ecosystems. pp. 185-203. In S. T. Knick and J. W. Connelly (Eds.), *Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and Its Habitats* (pp. 185-203). *Studies in Avian Biology Series* (Vol. 38), Berkeley, CA: University of California Press.
- Bechard, M. J., and J. K. Schmutz. (1995). Ferruginous Hawk (*Buteo regalis*), No. 172. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/172/>.
- BLM. (2015). Jarbidge Resource Management Plan. Boise, ID: USDI, Bureau of Land Management.
- BLM. (1996). Sampling Vegetation Attributes. Interagency Technical Reference 1734-4.
- BLM. 1998. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. BLM Technical Reference 1737-15.
- BLM. (2012). Slickspot Peppergrass Occurrence Potential Model (GIS). Twin Falls, ID: USDI, Bureau of Land Management, Jarbidge Field Office.
- Brewer, T. K., J. C. Mosley, D. E. Lucas, and L. R. Schmidt. (2007). Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland. *Rangeland Ecology and Management* 60:498–507.
- Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. (2000). Guidelines to Manage Sage Grouse Populations and their Habitats. *Wildlife Society Bulletin* 28(4): 967–985.
- Conover, M. R., J. S. Borgo, R. E. Dritz, J. B. Dinkins, and D. K. Dahlgren. (2010). Greater Sage-grouse Select Nest Sites to Avoid Visual Predators but not Olfactory Predators. *Condor* 112:331–336.
- Cooperative Extension Service, USDA, and NRCS. (1999). Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3.
- Daubenmire, R. F. (1940). Plant Succession Due to Overgrazing in the Agropyron Bunchgrass Prairie of Southeastern Washington. *Ecology* 21:55–64.

- Green, J. S., and Flinders, J. T. (1980). *Brachylagus idahoensis*, No. 125. Washington, DC: American Society of Mammalogists.
- Heady, L. T., and J. W. Laundré. (2005). Habitat Use Patterns Within the Home Range of Pygmy Rabbits (*Brachylagus idahoensis*) in Southeastern Idaho. *Western North American Naturalist* 65(4):490–500.
- Holloran, M. J., and S. H. Anderson. (2005). Spatial Distribution of Greater Sage-grouse Nests in Relatively Contiguous Sagebrush Habitats. *Condor* 107:742–752.
- Holloran, M. J., B. J. Heath, A. G. Lyon, S. J. Slater, J. L. Kuipers, and S. H. Anderson. (2005). Greater Sage-grouse Nesting Habitat Selection and Success in Wyoming. *Journal of Wildlife Management* 69:638–649.
- Holloran, M. J., R. C. Kaiser, and W. A. Hubert. (2007). Population Response of Yearling Greater Sage-grouse to the Infrastructure of Natural Gas Fields in Southwestern Wyoming. Laramie, WY: USDI, Geological Survey.
- IDEQ. 2000. Bruneau Subbasin Assessment and Total Maximum Daily Loads. Idaho Department of Environmental Quality. Twin Falls Regional Office. Twin Falls, Idaho.
- IDEQ. (2014). Idaho Department of Environmental Quality Final 2012 Integrated Report. Boise, ID: Idaho Department of Environmental Quality.
- Johansen, J. R. 1993. Cryptogamic crusts of semiarid and arid lands of North America. *Journal of Phycology*. 29(2):140-147.
- Knick, S. T., and J. W. Connelly. (2011). Greater Sage-grouse and Sagebrush: an Introduction to the Landscape. In S. T. Knick and J.W. Connelly (Eds.), *Greater Sage-grouse Ecology and Conservation of a Landscape Species and Its Habitats* (pp. 1-9). Berkeley, CA: University of California Press.
- Knick, S. T., and D. L. Dyer. (1997). Distribution of Black-Tailed Jackrabbit Habitat Determined by GIS in Southwestern Idaho. *Journal of Wildlife Management* 61:75–85.
- Martin, J. W., and B. A. Carlson. (1998). Sage Sparrow (*Artemisiospiza belli*), No 326. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/326/>.
- Moseley, R.K. (1994). Report on the Conservation Status of *Lepidium Papilliferum*. Boise, ID: Idaho Conservation Data Center and Idaho Department of Fish and Game.
- Pellant, M., P. Shaver, D. A. Pyke, and J. E. Herrick. (2005). Interpreting Indicators of Rangeland Health, Version 4. Technical Reference 1734-6.

- Reynolds, T. D., and W. L. Wakkinen. (1987). Characteristics of the Burrows of Four Species of Rodents in Undisturbed Soils in Southeastern Idaho. *American Midland Naturalist* 118 (2): 245–250.
- Rickart, E. A. (1987). *Spermophilus townsendii*, No. 268. Washington, DC: American Society of Mammalogists.
- Rotenberry, J. T., M. A. Patten, and K. L. Preston. (1999). Brewer's Sparrow (*Spizella breweri*), No. 390. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/390/>.
- Rowland, M. M., M. J. Wisdom, L. H. Suring, and C. W. Meinke. (2006). Greater Sage-grouse as an Umbrella Species for Sagebrush-associated Vertebrates. *Biological Conservation* 129: 323–335.
- Steenhof, K., E. Yensen, M. N. Kochert, and K. L. Gage. (2006). Populations and Habitat Relationships of Piute Ground Squirrels in Southwestern Idaho. *Western North American Naturalist* 66(4):482–491.
- Steenhof, K. (2013). Prairie Falcon (*Falco mexicanus*), No. 346. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/346/>.
- Stiver, S. J., E. T. Rinkes, and D. E. Naugle. (2010). Sage-grouse Habitat Assessment Framework. Boise, ID: USDI, Bureau of Land Management, Idaho State Office.
- USDA and NRCS. (2012). Soil Survey Geographic (SSURGO) Database for Elmore, Owyhee, and Twin Falls Counties, Idaho. Boise, ID: USDA, Natural Resources Conservation Service, Soil Survey Staff, Retrieved in August, 2012 from: <http://soildatamart.nrcs.usda.gov>.
- USDA and NRCS. (2013a). Draft Ecological Site Description R025XY019ID, Loamy 10-13" Wyoming Big Sagebrush/Bluebunch wheatgrass ecological site. Boise, ID: State Office.
- USDA and NRCS. (2013b). Draft Ecological Site Description R011XY001ID, Loamy 8-12" Wyoming Big Sagebrush/Bluebunch wheatgrass-Thurber's needlegrass ecological site. Boise, ID: State Office
- USDA and NRCS. (2013c). The PLANTS Database. Retrieved December 14, 2013, from: <http://plants.usda.gov>.
- Van Horne, B., G. S. Olson, R. L. Schooley, J. G. Corn, and K. P. Burnham. (1997). Effects of Drought and Prolonged Winter on Townsend's Ground Squirrel Demography in Shrubsteppe Habitats. *Ecological Monographs* 67:295–315.

- Wambolt, C. L., and G. F. Payne. (1986). An 18-Year Compromise of Control Methods for Wyoming Big Sagebrush in Southwestern Montana. *Journal of Range Management*, 39(4), 314-319.
- Wisdom, M. J., R. S. Holthausen, B. C. Wales, C. D. Hargis, V. A. Saab, D. C. Lee, et al. (2000). Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-Scale Trends and Management Implications, Volume 2: Group Level Results (General Technical Report No. PNW-GTR-485). Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.
- Stiver, S.J., E.T. Rinkes, and D.E. Naugle. 2010. Sage-Grouse Habitat Assessment Framework. , Bureau of Land Management Unpublished Report. U.S. Department of Interior, Bureau of Land Management, Idaho State Office, Boise, ID.
- Woods, C. P., and T. J. Cade. (1996). Nesting Habits of the Loggerhead Shrike in Sagebrush. *Condor* 98 (1):75–81.
- Yensen, E., D. L. Quinney, K. Johnson, K. Timmerman, and K. Steenhof. (1992). Fire, Vegetation Changes, and Population Fluctuations of Townsend's Ground Squirrels. *American Midland Naturalist* 128:299–312.
- Yensen, E., and P. W. Sherman. (2003). Ground Dwelling Squirrels of the Pacific Northwest. Boise, ID and Portland, OR: US Fish and Wildlife Service and USDI, Bureau of Land Management.
- Yosef, R. (1996). Loggerhead Shrike (*Lanius ludovicianus*), No. 231. In A. Poole (Ed.), *The Birds of North America Online*. Ithaca, NY: Cornell Laboratory of Ornithology, Retrieved in March, 2014 from: <http://bna.birds.cornell.edu/bna/species/231/>.
- Young, J. A., E. Martens, and N. E. West. 1992. Germination of bur buttercup seeds. *Journal of Range Management* 45(4):358-362.

**APPENDIX A: SPECIES LIST ACCUMULATED DURING UPLAND ASSESSMENTS**

Scientific Name	Common Name	Species Type	Site(s) where species occurred
<b>Perennial Grasses</b>			
<i>Achnatherum hymenoides</i>	Indian ricegrass	Native	BF1, BF2, BF3_1, BF4_1
<i>Achnatherum thurberianum</i>	Thurber's needlegrass	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF6
<i>Agropyron cristatum</i>	CRested wheatgrass	Exotic, Seeded	BF1, BF6
<i>Bromus inermis</i>	Smooth brome	Exotic	BF1
<i>Elymus elymoides</i>	Bottlebrush squirreltail	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_2, BF6
<i>Leymus cinereus</i>	Basin wildrye	Native	BF6
<i>Pascopyrum smithii</i>	Western wheatgrass	Native	BF4_1, BF4_2, BF5_1, BF7_1
<i>Poa secunda</i>	Sandberg bluegrass	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_1, BF5_2, BF6, BF7_1, BF7_2
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass	Native, Seeded	BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_1, BF5_2, BF6, BF7_2
<b>Annual Grasses</b>			
<i>Bromus tectorum</i>	Cheatgrass	Exotic, Invasive	BF1, BF2, BF3_1, BF3_2, BF4_2, BF5_1, BF5_2, BF6
<i>Vulpia octoflora</i>	Sixweeks fescue	Native	BF2
<b>Perennial Forbs</b>			
<i>Achillea millefolium</i>	Western yarrow	Native, Sage-grouse Preferred	BF5_2, BF6, BF7_2
<i>Allium</i> spp.	Onion	Native	BF1, BF3_2, BF4_1, BF4_2, BF5_1, BF7_1, BF7_2
<i>Allium acuminatum</i>	Tapertip onion	Native	BF5_2
<i>Allium nevadense</i>	Nevada onion	Native	BF2, BF3_1, BF3_2, BF6
<i>Antennaria dimorpha</i>	Low pussytoes	Native, Sage-grouse Preferred	BF1, BF3_1, BF5_1, BF5_2
<i>Arabis</i> spp.	Rockcress	Native	BF1
<i>Arnica sororia</i>	Twin arnica	Native	BF5_2
<i>Astragalus</i> spp.	Milkvetch	Native	BF1, BF3_1, BF3_2, BF5_2
<i>Astragalus atratus</i>	Mourning milkvetch	Native	BF1, BF2, BF4_1, BF5_2
<i>Astragalus lentiginosus</i>	Freckled milkvetch	Native	BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_2, BF6, BF7_2
<i>Astragalus purshii</i>	Woollypod milkvetch	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF5_2

			BF7_2
<i>Balsamorhiza hookeri</i>	Hooker's balsamroot	Native	BF1
<i>Calochortus nuttallii</i>	Sego lily	Native	BF4_2
<i>Castilleja angustifolia</i>	Northwestern Indian paintbrush	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF5_1, BF7_1
<i>Chaenactis douglasii</i>	Douglas' dustymaiden	Native	BF1
<i>Crepis acuminata</i>	Tapertip hawksbeard	Native, Sage-grouse Preferred	BF5_2, BF6
<i>Crepis occidentalis</i>	Largeflower hawksbeard	Native, Sage-grouse Preferred	BF4_1, BF6
<i>Delphinium andersonii</i>	Anderson's larkspur	Native	BF1, BF4_1, BF5_1, BF5_2
<i>Erigeron pumilus</i>	Shaggy fleabane	Native, Sage-grouse Preferred	BF1, BF2, BF3_2, BF4_1, BF4_2, BF5_1, BF5_2, BF6, BF7_2
<i>Eriogonum ovalifolium</i>	Cushion buckwheat	Native	BF1, BF2
<i>Linanthus pungens</i>	Granite prickly phlox	Native	BF2, BF3_1
<i>Linum lewisii</i>	Lewis flax	Native	BF3_2
<i>Lomatium</i> spp.	Desertparsley	Native, Sage-grouse Preferred	BF1
<i>Lomatium cous</i>	Cous biscuitroot	Native, Sage-grouse Preferred	BF2, BF6
<i>Lomatium foeniculaceum</i>	Desert biscuitroot	Native, Sage-grouse Preferred	BF3_1
<i>Machaeranthera canescens</i>	Hoary tansyaster	Native	BF1, BF3_2, BF5_2, BF6
<i>Medicago sativa</i>	Alfalfa	Exotic, Sage-grouse Preferred	BF7_2
<i>Penstemon</i> spp.	Penstemon	Native	BF4_1, BF5_2, BF7_1
<i>Penstemon procerus</i>	Littleflower penstemon	Native	BF1, BF2
<i>Penstemon speciosus</i>	Royal penstemon	Native	BF3_2
<i>Phlox aculeata</i>	Sagebrush phlox	Native, Sage-grouse Preferred	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_1, BF5_2, BF6, BF7_1, BF7_2
<i>Phlox hoodii</i>	Spiny phlox	Native, Sage-grouse Preferred	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_2, BF6, BF7_1
<i>Phlox longifolia</i>	Longleaf phlox	Native, Sage-grouse Preferred	BF1, BF2, BF3_1, BF3_2, BF4_1, BF5_1, BF5_2, BF7_1, BF7_2
<i>Taraxacum officinale</i>	Common dandelion	Exotic, Sage-grouse Preferred	BF1, BF6
<i>Tragopogon dubius</i>	Yellow salsify	Exotic, Sage-grouse Preferred	BF1, BF2, BF3_2, BF4_2, BF5_2, BF6, BF7_2
<i>Zigadenus venenosus</i>	Meadow deathcamas	Native	BF2, BF3_1, BF4_2, BF5_2, BF7_2
<b>Annual Forbs</b>			
<i>Agoseris glauca</i>	Pale agoseris	Native, Sage-grouse Preferred	BF1, BF2, BF3_1, BF3_2,

			BF4_2, BF5_2, BF6, BF7_1, BF7_2
<i>Cerastium nutans</i>	Nodding chickweed	Native	BF2, BF3_1, BF4_2, BF6
<i>Ceratocephala testiculata</i>	Curvseed butterwort	Exotic	BF1, BF2, BF3_1, BF3_2, BF5_2, BF6
<i>Collinsia parviflora</i>	Maiden blue eyed Mary	Native	BF1, BF3_1, BF5_2, BF6
<i>Descurainia pinnata</i>	Western tansymustard	Native	BF3_2, BF5_2
<i>Descurainia incana</i>	Mountain tansymustard	Native	BF3_2, BF5_2
<i>Draba verna</i>	Spring draba	Exotic	BF1, BF5_2, BF6
<i>Epilobium brachycarpum</i>	Tall annual willowherb	Native, Sage-grouse Preferred	BF1, BF3_2, BF5_2, BF6
<i>Gayophytum</i> spp.	Groundsmoke	Native, Sage-grouse Preferred	BF2, BF3_2
<i>Lactuca serriola</i>	Prickly lettuce	Exotic, Sage-grouse Preferred	BF5_2, BF6
<i>Lepidium perfoliatum</i>	Clasping pepperweed	Exotic	BF1, BF2, BF3_2, BF5_2, BF6
<i>Microsteris gracilis</i>	Slender phlox	Native, Sage-grouse Preferred	BF1, BF2
<i>Sisymbrium altissimum</i>	Tall tumbledustard	Exotic	BF1, BF3_2, BF4_2, BF5_2, BF6
<b>Shrubs</b>			
<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	Wyoming big sagebrush	Native	BF1, BF2, BF3_1, BF3_2, BF4_1, BF4_2, BF5_1, BF5_2, BF6, BF7_1, BF7_2
<i>Atriplex confertifolia</i>	Shadscale saltbush	Native	BF7_2
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	Native	BF1, BF2, BF3_2, BF4_2, BF6, BF7_2
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	Native	BF1, BF2, BF3_2, BF5_2, BF6
<i>Grayia spinosa</i>	Spiny hopsage	Native	BF1, BF2, BF4_1
<i>Gutierrezia sarothrae</i>	Broom snakeweed	Native	BF1, BF2

This list does not include all plants that can be found in the Buck Flat AMP Allotment and is not exhaustive. Scientific and common names were derived from the USDA NRSC Plant Database (USDA and NRCS, 2013c).

## **APPENDIX B: PROCESS FOR GENERATING SAGE-GROUSE HABITAT ASSESSMENT FRAMEWORK SAMPLE SITES**

Sage-grouse Habitat Assessment Framework sites were randomly generated in the following manner. In GIS the vegetation layer was broken into the following habitat categories: shrublands, native perennial grass, non-native perennial grass, and annual grassland. The pasture layer was then incorporated and six random points were generated for each habitat category in the pasture.

Using National Agriculture Imagery Program imagery, any points that fell in non-habitat (maintained roads, ponds, gravel pits, cliffs) were removed. To ensure sampling transects did not cross allotment or pasture boundaries, randomly selected points within 100 meters of fences were removed. Random points were also evaluated for ease of access and to maximize sampling efficiency; random points that were more than one mile from a road, jeep trail, or fence were generally dropped. In cases where the amount of BLM land in a pasture was small and state or private land dominated the pasture, the pasture was generally dropped from sampling. Also if the habitat category was minimally present such as 30 acres of annual grassland out of a 1,200 acres pasture, no sampling would be done in the annual area. For shrublands to be evaluated they had to be at least 20 acres in size to accommodate sampling transects.

Ultimately, only two random sites in each habitat category were retained. Two points were retained to provide an alternate sampling site if the first point was not in the appropriate habitat category due to mapping errors. If both points were not in the appropriate habitat category, field crews were instructed to travel to the nearest appropriate habitat in the pasture, select a random bearing leading into the habitat category and pace a randomly selected distance prior to sampling.

Due to limited field crew and time when forbs are easily discernable, the following was the priority order for sampling: (1) shrubland habitats; (2) perennial native grassland, (3) non-native perennial grass; and (4) annual grass communities. When randomly generated points in shrubland habitats were in the same general area as randomly generated points in grassland habitats, field crews would often sample both sites on the same day regardless of their priority order. This was to increase sampling efficiency by reducing the amount of time spent traveling between points.