

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

RANGELAND HEALTH ASSESSMENT AND EVALUATION REPORT

HORSE BUTTE AMP ALLOTMENT #01120

October 16, 2015

U.S. Department of the Interior
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ALLOTMENT INFORMATION

Field Office: Jarbidge Field Office (JFO)

Name of Permittee: Camas Creek Cattle Association, LLC

Allotment Name/Number: Horse Butte AMP (01120)

Date of Field Assessment: June 4 and 27, and July 2, 2013

Stream Miles on Public Land (miles): 2.2 miles of non-perennial stream

Table 1: Horse Butte AMP acres

Total Acres	BLM Acres	State Acres	Private Acres	Other Acres
23,117	22,477	640	0	0

Table 2: Assessment participants

Name	Position
Kate Crane	TFD Fisheries Biologist
Jim Klott	JFO Wildlife Biologist
Michael Haney	JFO Wildlife Biologist and Botanist
Krystle Wengreen	JFO Wild Horse and Burro Specialist
Dan Strickler	JFO Rangeland Management Specialist
Bonnie Ross	TFD GIS Specialist

CURRENT PERMITTED LIVESTOCK GRAZING USE

Total Active Use: 1,519 Animal Unit Months (AUMs)

Livestock Type: Cattle

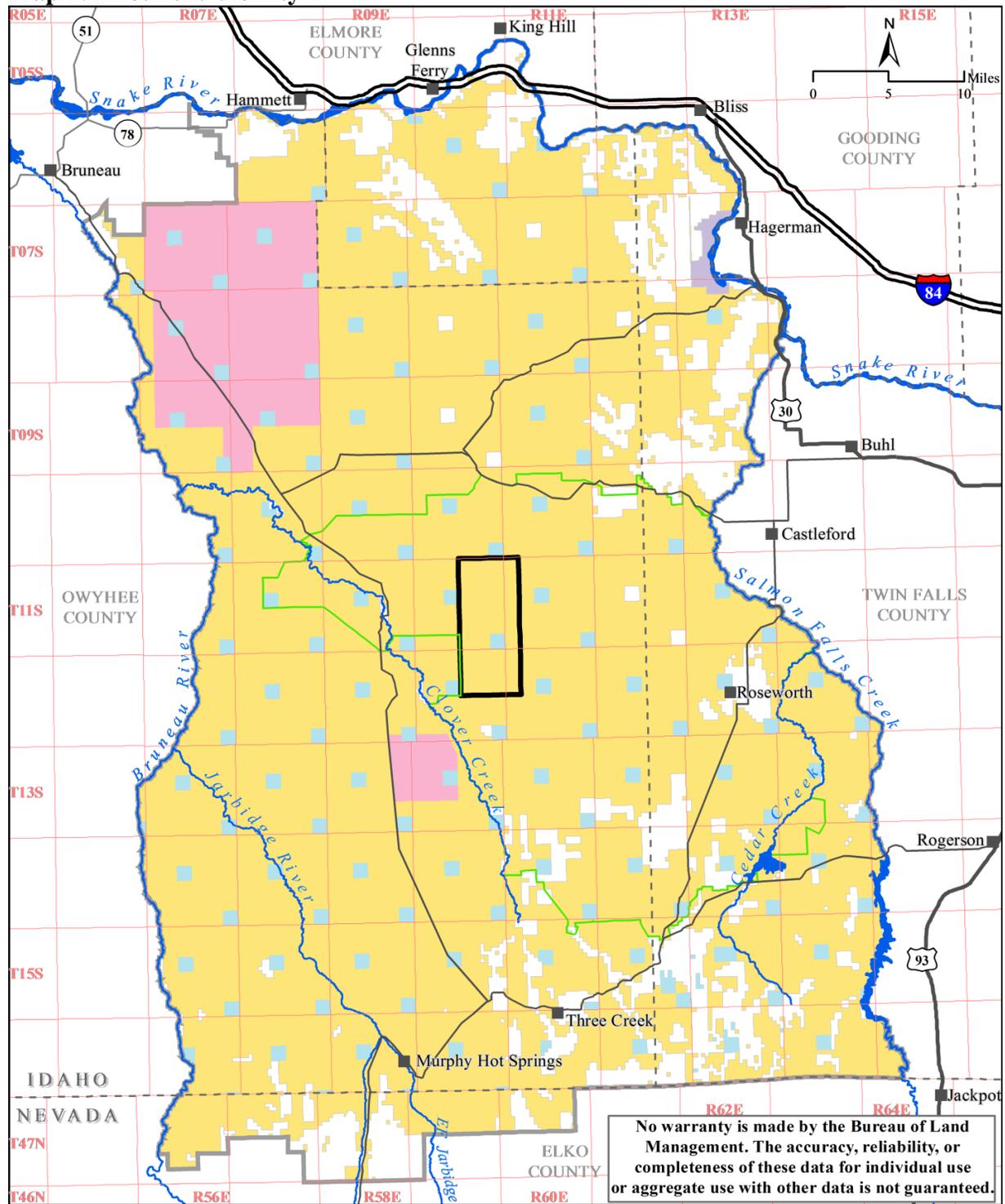
Livestock Numbers: 190 Cattle

Season of Use: 04/01 to 11/30

Current Land Use Plan: 1987 Jarbidge Resource Management Plan (RMP)

Current Stocking Level: 14.8 Acres/AUM

Map 1: Allotment Vicinity



Horse Butte 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 Horse Butte AMP Allotment is located approximately 20 miles west of Castleford, Idaho (Map 1). The elevation ranges from approximately 4,500 to 5,050 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 Horse Butte 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 within 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"). Plant growth was likely enhanced in 2005 and 2011 due to higher amounts of spring rainfall (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: Annual Precipitation (2004 – 2013) at the Horse Butte RAWS Station

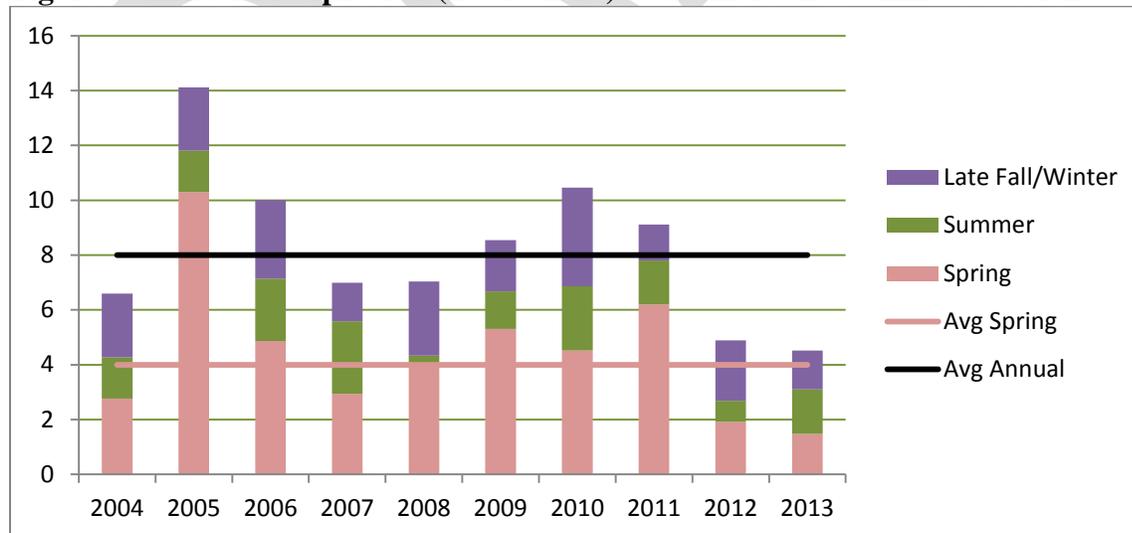
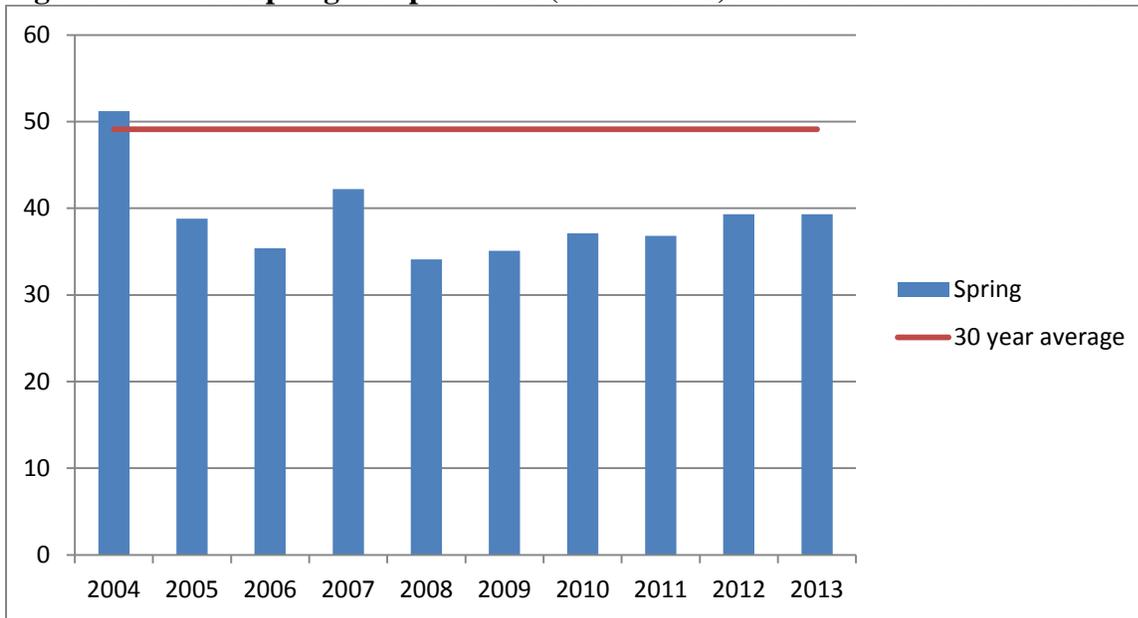


Figure 2: Annual Spring Temperatures (2004 – 2013) at the Horse Butte RAWs Station



Grazing Management

The Horse Butte AMP Allotment is divided into four pastures (Table 3). The allotment is fenced on all sides and an underground pipeline and water trough system provides livestock water to each pasture (Map 2). Cattle are permitted to graze the allotment from April 1 to November 30 with a permitted active use of 1,519 AUMs.

In addition to the four pastures described above, an additional 161 acres administered by the BLM occur within the allotment and are within a corral (6 acres), a holding pasture (153 acres), and the enclosure around Horse Butte Reservoir (2 acres). For the purposes of this Rangeland Health Assessment (RHA), the holding pasture is assessed as being a part of the Southeast Pasture. Likewise, the corral and enclosure are assessed as being a part of the Southwest Pasture. The acres for these areas have been added to the acreage for the appropriate pasture and will not be discussed separately in this document.

Table 3: Acreage by pasture and ownership in the Horse Butte AMP Allotment

Pasture Name	Public	State	Private	Total*
Northwest	5,802	0	0	5,802
Northeast	5,754	0	0	5,754
Southwest	5,746	0	0	5,746
Southeast	5,175	639	0	5,814
Allotment Total	22,477	639	0	23,116

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

Through the late 2000s, the Horse Butte 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

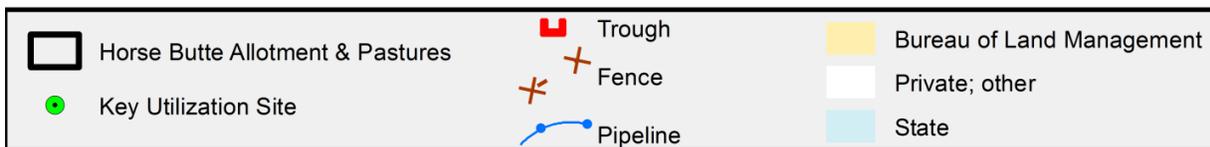
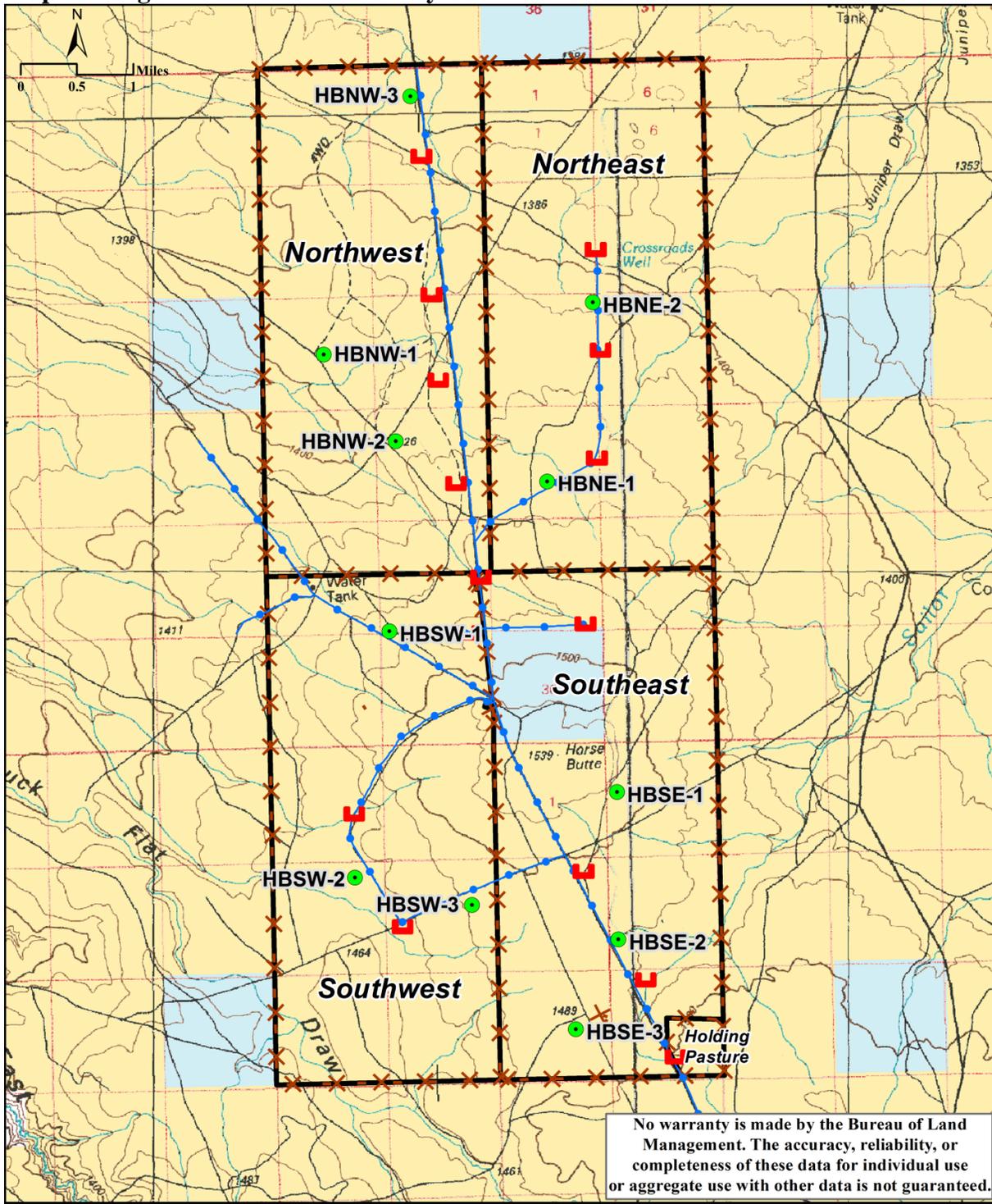
through December. However, the AMP did not establish a limit on AUMs within the allotment, and states:

“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.”

Since the implementation of the AMP, the allotment has typically been grazed by cattle from late March through August. The allotment was also grazed during January and February in some years prior to 1997. From 1979 through 1997, actual grazing use within the allotment averaged 3,334 AUMs while actual grazing use averaged 1,596 AUMs from 1998 through 2013.

Up until 2004, when a Federal District Court order disallowed Temporary Non-Renewable (TNR) authorizations, TNR had been authorized under the Devil Creek AMP or through annual National Environmental Policy Act (NEPA) analysis and decisions. Since 2005, Congressional Appropriations language has allowed the JFO to annually authorize up to the allotment’s highest TNR authorization between 1997 and 2003, which is 1,180 AUMs when forage is available. Actual use values shown in Tables 4 and 5 that exceed the active permitted use are TNR AUMs.

Map 2: Range Infrastructures and Key Utilization Sites



The Horse Butte AMP Allotment is now 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 deferred rotation system was initiated in 2009 in response to the Court Order. Within the deferred 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 2006. The allotment has typically been grazed between March and June over the past several years. In two of the past 10 years the allotment was grazed again between October and December (Table 4).

Actual use and percent utilization for each pasture within the Horse Butte AMP Allotment from 2005 to 2014 can be seen in Table 4. Utilization has been measured on bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Thurber's needlegrass (*Achnatherum thurberianum*), and Sandberg bluegrass (*Poa secunda*). Utilization data was collected by the height-weight method (Cooperative Extension Service et al., 1999). Locations of key utilization sites are shown on Map 3.

Table 4: Actual grazing use and percent utilization by pasture since 2005

Pasture	Year	Actual Use		Percent Utilization			
		Season of Use	AUMs	Bluebunch wheatgrass	Idaho fescue*	Thurber's needlegrass	Sandberg bluegrass
Northwest	2005	Spring	615	-	-	-	-
	2006	Spring	661	9%	10%	-	-
	2007	Spring	613	-	7%	-	-
	2008	Spring	421	-	4%	8%	6%
	2009	Spring	592	-	11%	-	-
	2010	Spring	345	-	-	0%	-
		Fall/Winter	679	-	-	-	-
	2011	Spring	247	-	-	10%	-
		Fall/Winter	688	-	-	-	-
	2012	Rested	0	-	-	-	-
2013	Rested	0	-	-	-	-	
2014	Fall/Winter	602	-	-	-	-	
Northeast	2005	Spring	496	-	-	-	-
	2006	Rested	0	-	-	-	-
	2007	Rested	0	-	-	-	-
	2008	Rested	0	-	-	-	-
	2009	Spring/Summer	815	-	-	-	-
	2010	Spring	986	-	-	14%	-
	2011	Spring	691	-	-	4%	-
	2012	Spring	614	-	-	2%	-
	2013	Summer	921	-	-	15%	-
	2014	Rested	0	-	-	-	-
Southwest	2005	Spring/Summer	219	-	-	-	-
	2006	Spring	380	5%	10%	-	-
	2007	Spring	393	-	9%	-	-
	2008	Spring	451	-	7%	6%	7%

Pasture	Year	Actual Use		Percent Utilization			
		Season of Use	AUMs	Bluebunch wheatgrass	Idaho fescue*	Thurber's needlegrass	Sandberg bluegrass
	2009	Spring	289	-	0%	-	-
	2010	Fall/Winter	485	-	-	-	-
	2011	Fall/Winter	452	-	4%	-	-
	2012	Rested	0	-	-	-	-
	2013	Rested	0	-	-	-	-
	2014	Rested	0	-	-	-	-
Southeast	2005	Rested	0	-	-	-	-
	2006	Spring	320	7%	-	-	-
	2007	Spring/Summer	481	-	-	-	-
	2008	Spring	286	-	-	-	3%
	2009	Rested	0	-	-	-	-
	2010	Summer	181	-	-	31%	19%
	2011	Spring/Summer	625	-	-	4%	-
	2012	Spring/Summer	318	-	-	17%	-
	2013	Summer	264	-	-	19%	-
2014	Rested	0	-	-	-	-	

Spring Use (3/15 – 5/31); Summer Use (6/1 - 6/30); Fall/Winter Use (10/15 – 12/31)

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

*Although data shows utilization was recorded on Idaho fescue in the Northwest and Southwest Pastures, the ID Team believes this is a misidentification of Thurber's needlegrass. Idaho fescue is not expected to occur within the Horse Butte AMP Allotment.

A summary of actual use and average utilization for the Horse Butte AMP Allotment from 2005 to 2014 can be seen in Table 5. Since 2005, actual use within the Allotment has averaged 1,517 AUMs.

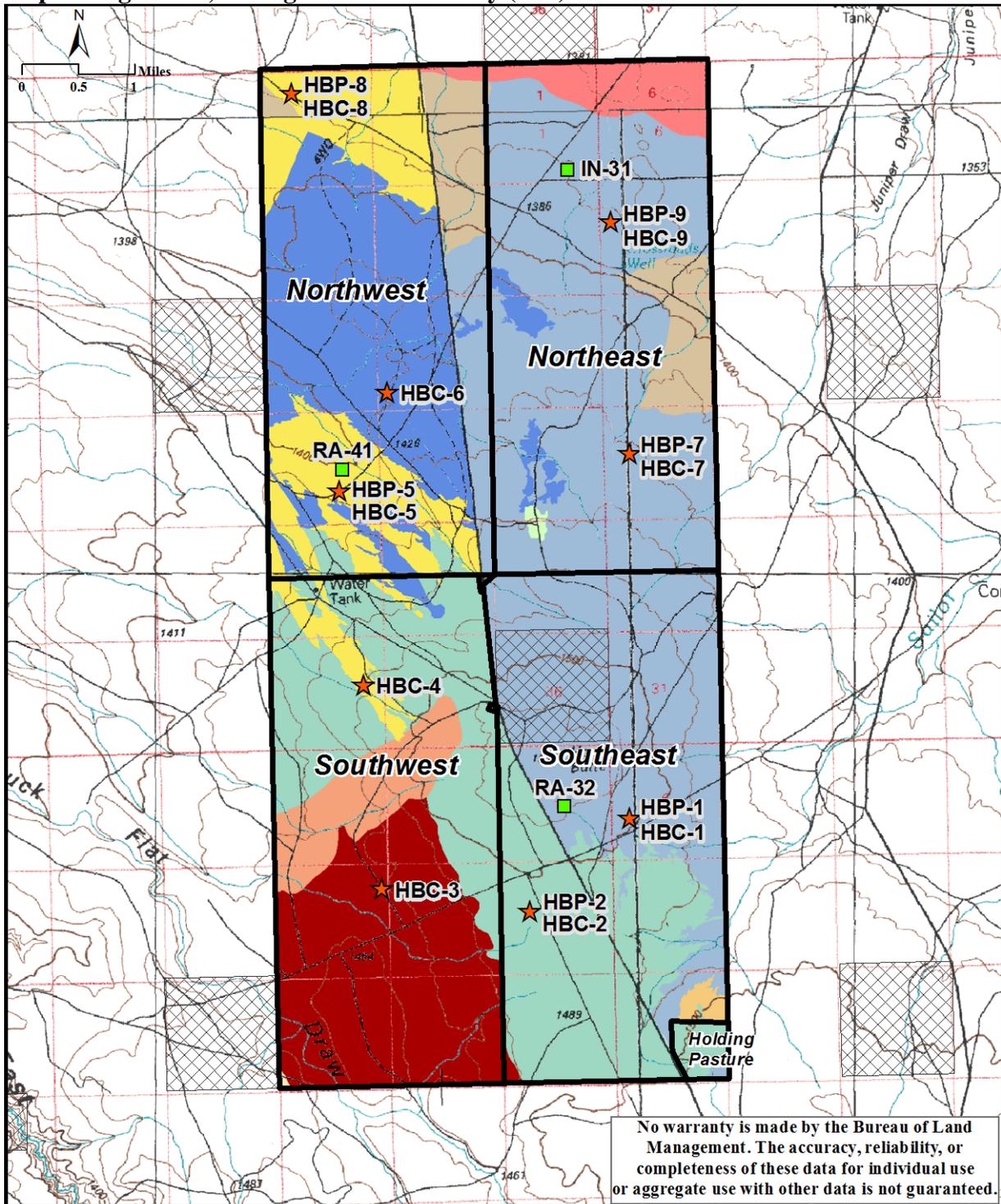
Table 5: Actual use and utilization summary for the Horse Butte AMP Allotment

Year	Actual Use (AUMs)	Average Utilization			
		Bluebunch wheatgrass	Idaho fescue*	Thurber's needlegrass	Sandberg bluegrass
2005	1,331	-	-	-	-
2006	1,361	7%	10%	-	-
2007	1,487	-	8%	-	-
2008	1,158	-	6%	7%	5%
2009	1,696	-	6%	-	-
2010	2,676	-	-	15%	19%
2011	2,746	-	4%	6%	-
2012	932	-	-	10%	-
2013	1,185	-	-	17%	-
2014	602	-	-	-	-

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

*Although data shows utilization was recorded on Idaho fescue, the ID Team believes this is a misidentification of Thurber's needlegrass. Idaho fescue is not expected to occur within the Horse Butte AMP Allotment.

Map 3: Vegetation, Ecological Site Inventory (ESI) & Production and/or Cover Plots



Horse Butte Allotment & Pastures		Vegetation Communities		Recent Burn	
	Non-BLM Land		Annual		Rabbitbrush/Bluegrass
	ESI Site		Bluegrass		WY Sage/Bluegrass
	Production and/or Cover Plot		Crested		WY Sage/Crested
			Rabbitbrush/Bluebunch		WY Sage/Thurbers
					Horse Butte Fire - 2012
					Kinyon Road Fire - 2012
					Horse Butte 2 Fire - 2013

The JFO livestock trailing EA (EA# DOI-BLM-ID-T010-2012-0004-EA) analyzed trailing that could be authorized along a primitive road in the Southeast and Southwest Pastures. While the EA could allow trailing for up to 400 cattle, no livestock trailing has occurred within the Horse Butte AMP Allotment. The Wells Juniper Ranch Grazing Association does not intend to trail livestock through the Horse Butte AMP Allotment at this time, but may in the future depending on transportation costs, or if fall weather inhibits trucking of livestock from the adjacent Juniper Ranch AMP Allotment.

Vegetation

Vegetation in the Horse Butte 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 3). 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).

The Horse Butte AMP Allotment was historically a shrub steppe plant community; however, the allotment has been affected by wildfires since at least 1973. Approximately 53 percent of the Horse Butte AMP Allotment has burned at least once within the past 20 years, and approximately 17 percent of the allotment has burned twice within that same time period (Table 6, Map 4).

Table 6: Fire frequency by pasture from 1993 to 2013

Pasture	Number of Times Burned 1993 - 2013	Acres of Pasture	Percentage of Pasture
Northwest (5,802 acres)	0	2,720	47%
	1	2,454	42%
	2	579	10%
	3	49	1%
Northeast (5,754 acres)	0	0	0%
	1	2,097	36%
	2	3,148	55%
	3	483	8%
	4	26	1%
Southwest (5,746 acres)	0	1,954	34%
	1	3,760	65%
	2	31	1%
Southeast (5,175 acres)	0	1,631	32%
	1	3,544	68%

Nine different wildfires have occurred within the allotment since 1973 and various drill and aerial seeding efforts have been undertaken to rehabilitate the burned areas. Six of the nine fires have occurred since 2002, including the most recent Horse Butte 2 wildfire of 2013 (Southwest Pasture). 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 1973 Horse Butte Fire burned approximately 3,903 acres (78%) of the Southeast Pasture, 603 acres (11%) of the Northeast Pasture, 72 acres (1%) of the Northwest Pasture, and 17 acres (<1%) of the Southwest Pasture. No fire rehabilitation information is available for this fire.

The 1985 West Juniper Fire burned approximately 271 acres (5%) of the Northeast Pasture. The fire rehabilitation plan did not prescribe seeding the burned area within the Horse Butte AMP Allotment.

The 1995 Tuana Fire (Clover Complex) burned approximately 1,275 acres (22%) of the Northwest Pasture and 539 acres (9%) of the Southwest Pasture. Following the fire, the burned areas of the Northwest and Southwest Pastures were drill seeded with “Hycrest” crested wheatgrass and aerially seeded with Wyoming big sagebrush, yellow sweetclover, and “Ladak” alfalfa.

The 2002 Big Crow Fire burned approximately 298 acres (5%) of the Northwest Pasture. Following the fire, the burned area of the Northwest Pasture was aerially seeded with Wyoming big sagebrush, western yarrow, and “Ladak” alfalfa.

The 2006 Sailor Cap Fire burned approximately 1,216 acres (21%) of the Northwest Pasture and 3,657 acres (64%) of the Northeast Pasture. Following the fire, approximately 562 acres of the Northwest and 1,563 acres of the Northeast Pastures were drill seeded with a mix of Sandberg bluegrass, “Anatone” bluebunch wheatgrass, squirreltail, basin wildrye, Lewis flax, “Eski” sainfoin, and globemallow. In addition, the burned areas were aerially seeded with Wyoming big sagebrush.

The 2007 Murphy Complex Fire burned approximately 999 acres (17%) of the Northwest Pasture, 5,754 acres (100%) of the Northeast Pasture, and 3,369 acres (67%) of the Southeast Pasture. Following the fire, approximately 342 acres of the burned area within the Southeast Pasture was drill seeded with a mix of Sandberg bluegrass, squirreltail, bluebunch wheatgrass, Lewis flax, alfalfa, and sainfoin. In addition, some of the burned areas within the allotment were aerially seeded with Wyoming big sagebrush.

The 2012 Horse Butte Fire burned approximately 728 acres (13%) of the Southwest Pasture. Following the fire, the burned area was drill seeded with a mix of “Anatone” bluebunch wheatgrass, Sherman big bluegrass, squirreltail, “Eski” sainfoin, western yarrow, and “Ladak” alfalfa. In addition, 5,000 Wyoming big sagebrush seedlings were hand planted throughout the burned area in patches of 200 to 500 plants.

The 2012 Kinyon Road Fire burned approximately 509 acres (9%) of the Northeast Pasture and 51 acres (<1%) of the Northwest Pasture. The fire rehabilitation plan did not prescribe seeding the burned area within the Horse Butte AMP Allotment.

The 2013 Horse Butte 2 Fire burned approximately 2,556 acres (45%) of the Southwest Pasture and 22 (<1%) acres of the Southeast Pasture. The burned area within the Horse Butte AMP Allotment was drill seeded with a mix of “Anatone” bluebunch wheatgrass, Sandberg bluegrass, squirreltail, “Eski” sainfoin, western yarrow, and “Ladak” alfalfa. In addition, the burned area was aerially seeded with Wyoming big sagebrush.

As a result of the fires and seeding efforts, plant communities within the Horse Butte 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 7, Map 3).

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Map 4: Fire Frequency

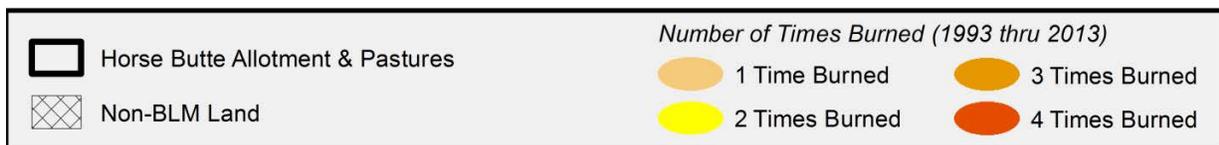
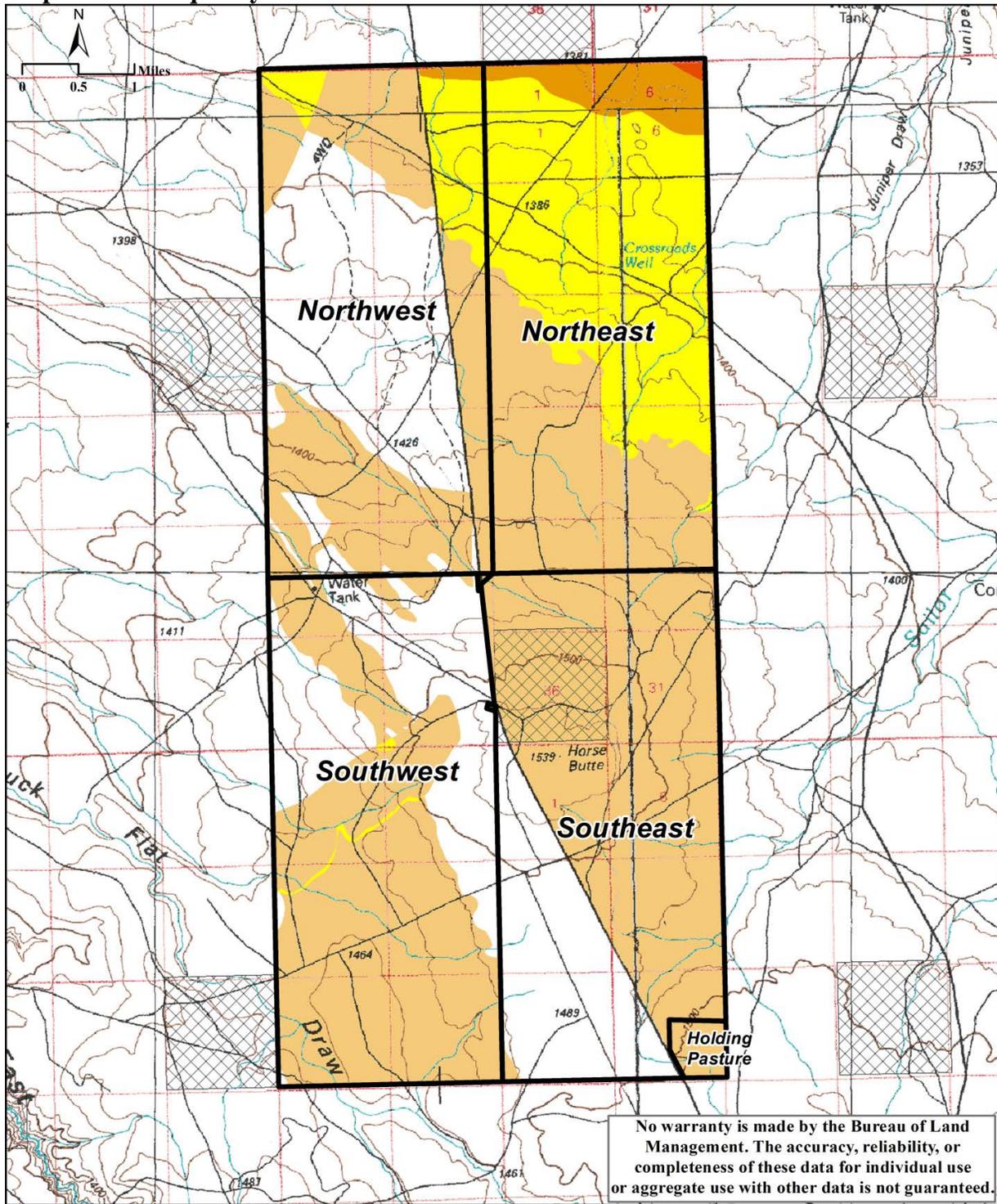


Table 7: Vegetation communities in acres and percentage by pasture

Vegetation Community	Northwest Pasture (5,802 Acres)	Northeast Pasture (5,754 Acres)	Southwest Pasture (5,746 Acres)	Southeast Pasture (5,175 Acres)
Crested wheatgrass	1,851 (32%)	0 (0%)	265 (5%)	0 (0%)
Wyoming big sagebrush/Crested wheatgrass	0 (0%)	0 (0%)	7 (<1%)	0 (0%)
Bluegrass	477 (8%)	4,553 (79%)	3 (0%)	2,662 (53%)
Wyoming big sagebrush/Bluegrass	131 (2%)	0 (0%)	2,141 (37%)	2,402 (45%)
Wyoming big sagebrush/Thurber's needlegrass	2,792 (48%)	174 (3%)	44 (<1%)	0 (0%)
Rabbitbrush/Bluebunch wheatgrass	0 (0%)	0 (0%)	0 (0%)	77 (2%)
Rabbitbrush/Bluegrass	0 (0%)	29 (1%)	0 (0%)	0 (0%)
Annual	490 (8%)	487 (8%)	0 (0%)	0 (0%)
Recent Burn*	41 (1%)	511 (9%)	3,276 (57%)	22 (<1%)
Barren	21 (1%)	0 (0%)	9 (<1%)	13 (<1%)

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

Vegetative production data were recorded in 2004 at six sites within the Horse Butte AMP Allotment (Map 3). Four of the six sites have burned since the data were collected. Moreover, one site (HBP-7) was drill seeded following the 2007 Murphy Complex Fire. The fires removed sagebrush from the sites and modified the vegetation communities. The vegetative production data recorded in 2004 are summarized in Table 8. The burned sites are included in Table 8 to show the pre-fire production of the site; however, site HBP-7 is not included in Table 8 since it was drill seeded following the Murphy Complex Fire, which further modified the vegetation community.

Three Ecological Site Inventory (ESI) sites are located within the Horse Butte AMP Allotment (Map 3). The ESI site (IN-31) within the Northeast Pasture burned in the 2006 Sailor Cap Fire and again in the 2007 Murphy Complex Fire. Furthermore, the ESI site (RA-32) in the Southeast Pasture burned in the Murphy Complex Fire of 2007 and was subsequently drill seeded. The fires removed sagebrush from the sites and modified the vegetation communities. Vegetative production data recorded during the 2006 ESI is summarized in Table 8. Site IN-31 is included in Table 8 to show the pre-fire production of the site; however, site RA-32 is not included in Table 8 since it was drill seeded following the Murphy Complex Fire, which further modified the vegetation community.

Table 8: Summary of 2004 and 2006 production data

Vegetation Class	Species	Production (Total Dry Weight in Pounds per Acre)							
		Loamy 8-12" ESD Reference Sheet	2004 Site HBP-1 (SE)*	2004 Site HBP-2 (SE)	2004 Site HBP-5 (NW)	2004 Site HBP-8 (NW)^	2004 Site HBP-9 (NE)**	2006 Site RA-41 (NW)	2006 Site IN-31 (NE)**
Perennial Grasses	Squirreltail (<i>Elymus elymoides</i>)	25 - 45	3	22	0	258	19	1	27
	Crested wheatgrass (<i>Agropyron cristatum</i>)	-	0	0	1,102	0	0	0	0
	Sandberg bluegrass (<i>Poa secunda</i>)	25 - 45	46	42	28	128	41	67	60
	Thurber's needlegrass (<i>Achnatherum thurberianum</i>)	8 - 180	22	12	36	269	77	39	31
	Intermediate wheatgrass (<i>Thinopyrum intermedium</i>)	-	12	2	7	0	0	0	0
	Western wheatgrass (<i>Pascopyrum smithii</i>)	-	0	0	0	0	1	0	0
	Thickspike wheatgrass (<i>Elymus lanceolatus</i>)	0 - 45	0	0	0	0	0	12	0
Annual Grasses	Cheatgrass (<i>Bromus tectorum</i>)	-	1	0	1	15	0	0	50
	Field brome (<i>Bromus arvensis</i>)	-	0	0	10	0	0	0	0
Perennial Forbs	Carpet phlox (<i>Phlox hoodii</i>)	0 - 5	1	10	0	0	16	0	0
	Longleaf phlox (<i>Phlox longifolia</i>)	0 - 5	20	28	43	60	21	0	6
	Morning milkvetch (<i>Astragalus atratus</i>)	0 - 5	11	0	0	0	0	0	0
	Hangingpod milkvetch (<i>Astragalus atropubescens</i>)	0 - 5	0	0	4	0	0	0	0
	Castilleja Spp.	-	0	0	0	0	7	0	0
	Meadow deathcamas (<i>Zigadenus venenosus</i>)	0 - 5	0	0	0	0	0	0	0
Annual Forbs	Tumblemustard (<i>Sisymbrium altissimum</i>)	-	0	0	0	0	0	0	32
	Tall annual willowherb (<i>Epilobium brachycarpum</i>)	-	0	0	0	14	0	0	3
Shrubs	Yellow rabbitbrush (<i>Chrysothamnus viscidiflorus</i>)	0 - 15	389	0	0	0	0	0	0
	Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	100 - 225	32	427	0	0	400	80	515
	Basin big sagebrush (<i>Artemisia tridentata</i>)	0 - 20	0	96	79	5	25	0	0
	Mountain big sagebrush (<i>Artemisia tridentata vaseyana</i>)	-	0	0	0	0	83	0	0
TOTAL		400 - 900	537	639	1,310	749	690	199	724

NW=Northwest Pasture, NE=Northeast Pasture, SE=Southeast Pasture

*This site burned in the 2007 Murphy Complex Fire.

^This site burned in the 2006 Sailor Cap Fire.

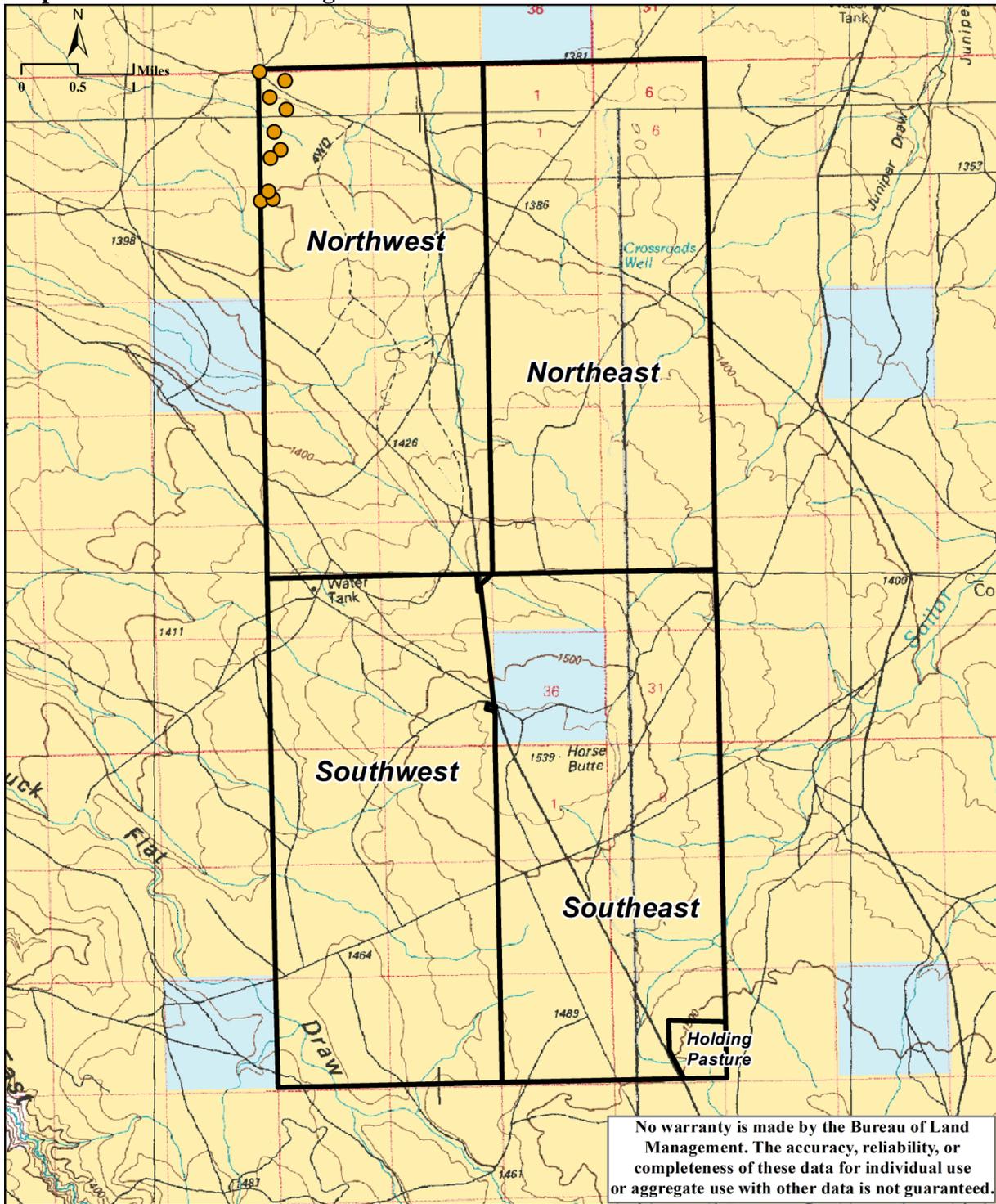
**This site burned in the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire.

Noxious Weeds

The State of Idaho has listed 65 plant species as noxious weeds. One noxious weed (rush skeletonweed (*Chondrilla juncea*)) is known to occur within the Horse Butte AMP Allotment (Map 5). There are ten known rush skeletonweed occurrences that are mapped within the allotment; all within the northwest corner of the Northwest Pasture. These occurrences were chemically treated in 2005. 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. Rush skeletonweed was also observed in the Northeast and Southeast Pastures during the Interpreting Indicators of Rangeland Health (IIRH) field visit.

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

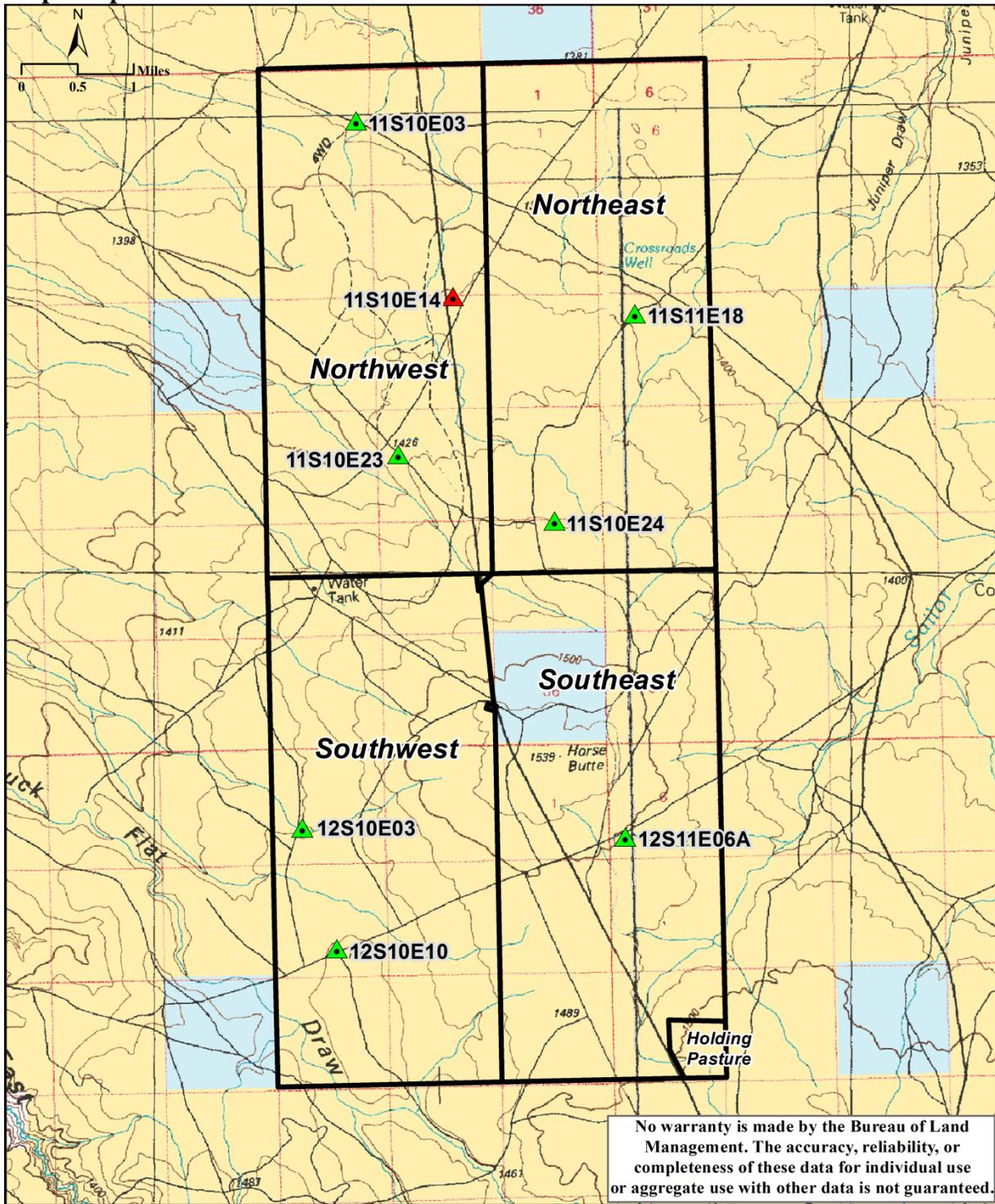


Upland Trend Monitoring

Upland trend monitoring sites have been established in all four pastures of the Horse Butte 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 using 4 different nested plots. For species that are common the smallest nested plot (plot 1) size is generally chosen to describe changes in frequency. A larger plot size is generally chosen (plots 2-4) for species that occur at a lower frequency. The photo plots are used to record vegetative plant cover. A total of seven long term trend sites have been established on public land within the allotment. Six of the seven sites have burned by wildfire since 2006 and five of the burned sites were 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.

Factors that limit the comparison of trend data over time include: 1) data were 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; 5) ground cover for shrubs and biological soil crusts were not always recorded when the plots were established; 6) Repeated wildfire and subsequent seeding of species different from those originally found at the site. An overview of upland trend monitoring is described below.

Map 6: Upland Trend Sites



Northwest Pasture

The Northwest Pasture has two upland trend (Nested Frequency/Photo Plot) sites; Site 11S10E03 was last read in 2013 and Site 11S10E23 was read in 2012. Additional photo plots (*11S10E14 1A*, and *11S10E14 1B*) were established in 1970; however, these sites could not be relocated. In 2012, a new photo plot (*11S10E14*) was established in the same area of the pasture as the lost photo plots.

Trend Site 11S10E03:

Site *11S10E03* (Photo 1) is located in a Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1986 and again in 1993, 2008, and 2013. The site burned in the 2006 Sailor Cap Fire and was subsequently drill seeded with a mix of Sandberg bluegrass, "Anatone" bluebunch wheatgrass, squirreltail, basin wildrye, Lewis flax, "Eski" sainfoin, and globemallow. It was also aurally seeded with Wyoming big sagebrush. Because the site burned and was subsequently drill seeded in 2006, comparison of the 2013 data to pre-seeding data would not be appropriate as a basis to support conclusions of overall trend; however, because the site was read again two (2008) and seven (2013) years after the fire, monitoring information is summarized in Table 9 and is described below to show the general recovery of the site and is used to compare trend over the five year period (2008 – 2013). Pictures of the trend site in 2008 and 2013 are shown in Photos 1 and 2.

Photo 1: Trend Site 11S10E03; July 1, 2008

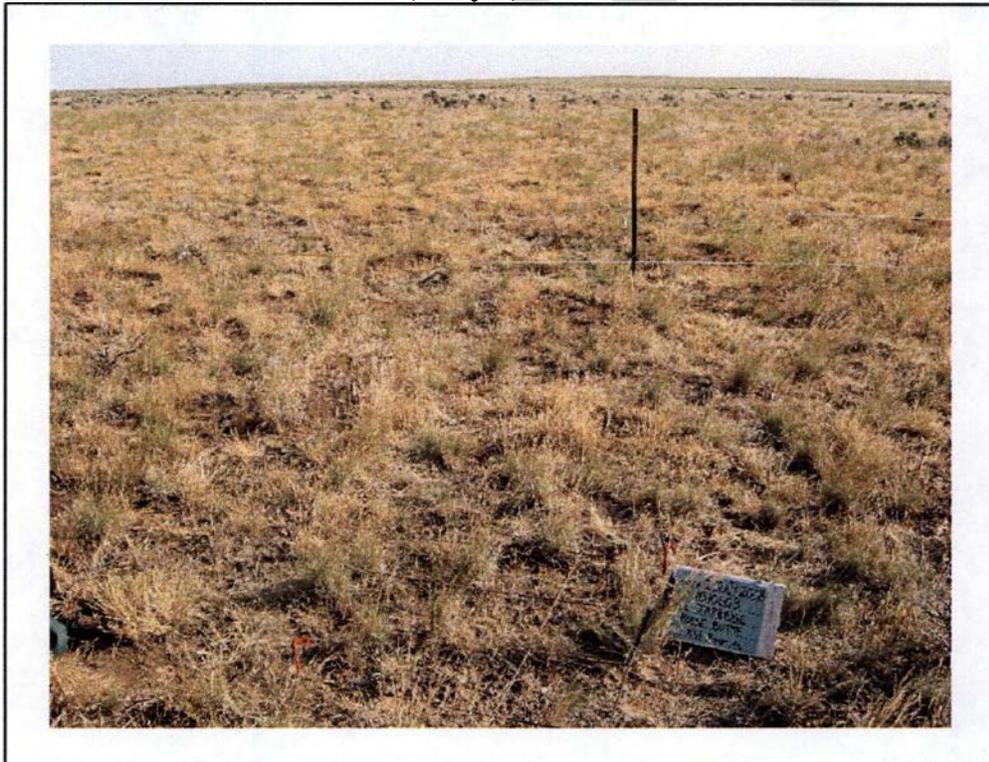


Photo 2: Trend Site 11S10E03; May 14, 2013



Table 9: Trend Site 11S10E03 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences	
		2008	2013
Thurber's needlegrass	2	23	30
Sandberg bluegrass	1	62	79
Bluebunch wheatgrass	4	0	1
Cheatgrass	4	27	31
Annual fescue	4	NR	70
Forbs (<i>Perennial and Annual</i>)	4	88	316
Wyoming big sagebrush (<i>Mature</i>)	4	0	4
Wyoming big sagebrush (<i>Seedling</i>)	4	0	4

NR-Not Recorded

The key species at the site are Thurber's needlegrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 2 within the nested frequency frame for Thurber's needlegrass and plot 1 for Sandberg bluegrass. The frequency of Thurber's needlegrass increased from 23 occurrences in 2008 to 30 occurrences in 2013. Sandberg's bluegrass was seeded following the 2006 fire and increased from 62 occurrences in 2008 to 79 occurrences in 2013. Although bluebunch wheatgrass was seeded in 2006, it was not recorded in 2008 and only one occurrence was recorded in 2013 (plot 4).

The total occurrences of forbs (plot 4) at the site have increased from 88 in 2008 to 316 in 2013. While the total occurrences have increased this is likely due to the timing of data collection (early July in 2008 versus mid-May in 2013). Eight species of perennial forbs were recorded at the site. Common species of perennial forbs at the site included longleaf phlox (*Phlox longifolia*) and sagebrush phlox (*Phlox aculeata*). Common annual forbs included mountain tansymustard (*Descurainia incana*), slender phlox (*Microsteris gracilis*), and tall annual willowherb (*Epilobium brachycarpum*).

The 2006 Sailor Cap Fire removed the majority of sagebrush from the site. Following the fire, the site was aerially seeded with Wyoming sagebrush. Four seedlings and 4 mature sagebrush occurrences were recorded along the five transects in 2013.

Data indicate cheatgrass has increased slightly from 27 occurrences (plot 4) in 2008 to 31 occurrences in 2013. Annual fescue was not recorded in 2008 but was recorded at 70 occurrences in 2013 (plot 4).

Bare ground decreased from 43 percent in 2008 to 5.5 percent in 2013. During this same time period, litter cover has increased from 5.7 to 52 percent; however, vegetation cover has decreased from 51.1 to 33.3 percent. Meanwhile, biological soil crusts were not recorded at the site in 2008 but comprised 9 percent of the ground cover in 2013.

The photo plot at the site was read in 2008; however, the data is incomplete and cannot be summarized or described. In 2013, Thurber's needlegrass was recorded at 14.7 percent of cover in the photo plot and Sandberg bluegrass was recorded at 15.4 percent cover. In addition, annual fescue was recorded at 4.5 percent cover in 2013. Cheatgrass was not recorded in the photo plot 2013.

Trend Site 11S10E23:

Site 11S10E23 is located in a Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 (Photo 3) and was re-read in 1993 and 2012 (Photo 4). In addition, the photo plot was read for the first time in 1992. Upland trend data for the site is summarized in Table 10 and is also described below.

Photo 3: Site 11S10E23; May 2, 1989



Photo 4: Site 11S10E23, May 20, 2012

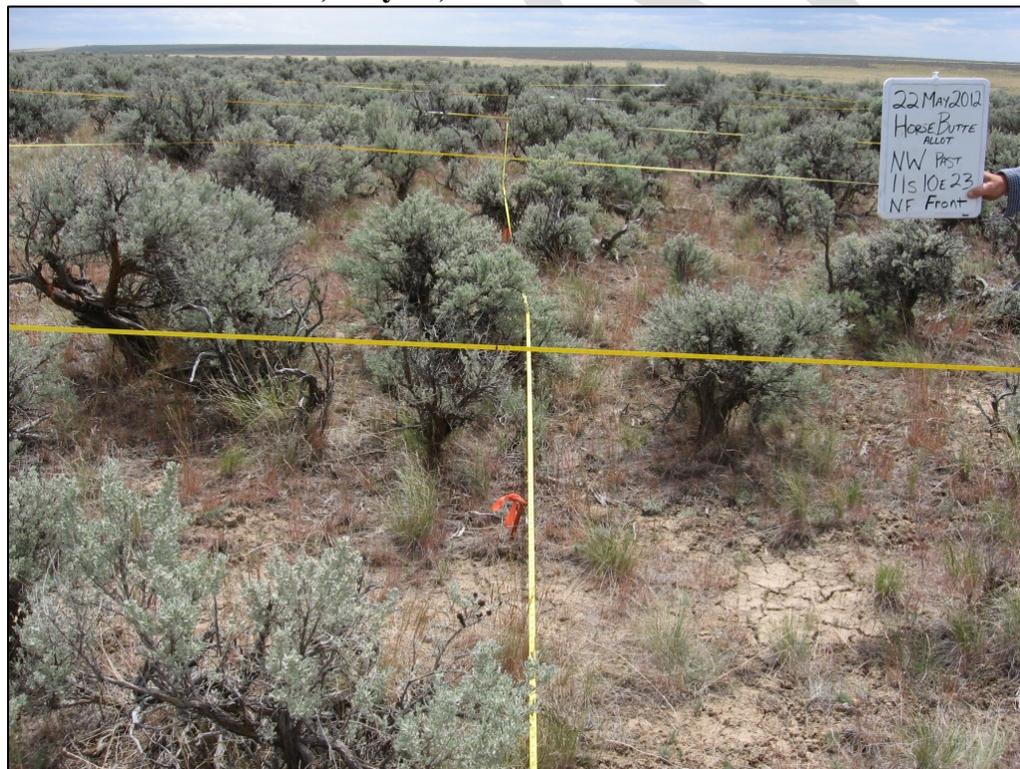


Table 10: Trend Site 11S10E23 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1989	1993	2012
Thurber's needlegrass	4	12	31	45
Sandberg bluegrass	1	22	23	44
Squirreltail	4	38	45	25
Cheatgrass	4	0	0	26
Annual fescue	4	0	0	74
Forbs (<i>Perennial and Annual</i>)	4	69	275	199
Wyoming big sagebrush (<i>Mature</i>)	4	32	26	27
Wyoming big sagebrush (<i>Seedling</i>)	4	2	0	3

Key species at the site are Thurber's needlegrass and Sandberg bluegrass. Plot 4 was used to compare the frequency of Thurber's needlegrass and plot 1 was used for Sandberg bluegrass. The frequency of Thurber's needlegrass has increased, with 12 occurrences in 1989, 31 occurrences in 1993, and 45 occurrences in 2012. Occurrences of Sandberg bluegrass have also increased, with 22 occurrences in 1989, 23 occurrences in 1993, and 44 occurrences in 2012. Although squirreltail decreased by 13 occurrences (plot 4) from 1989 to 2012, Thurber's needlegrass has increased by 33 occurrences over that same time period.

Cheatgrass was not recorded at the site in 1989 or 1993; however, it was recorded at 26 occurrences in 2012. Furthermore, annual fescue was also not recorded at the site in 1989 or 1993 but was recorded at 74 occurrences (plot 4) in 2012.

The total occurrences of forbs at that site have increased from 69 in 1989 to 199 in 2012. While the total occurrences of forbs were much higher in 2012, data for annual forbs were not recorded in 1989. Six species of perennial forbs were recorded in 1989 and 9 species were recorded in 2012. Common perennial forbs at the site included Anderson's larkspur (*Delphinium andersonii*), longleaf phlox, and spiny phlox (*Phlox hoodia*). The only common annual forb at the site was slender phlox.

Sagebrush has remained static at the site since the initial read with 34 total occurrences in 1989 and 30 occurrences in 2012. Although the slight decrease in sagebrush occurrences is not statistically significant, field notes from the 2012 reading indicate the presence of decadent/dead sagebrush plants at the site.

Ground cover of biological soil crusts were not recorded in 1989 or 1993 so comparisons cannot be made to the 2012 data. However, cover data collected in 2012 showed 17 percent biological soil crust. Bare ground has decreased at the site from 53 percent in 1989 to 27 percent in 2012. During this same time period, litter cover has remained static at 40 and 41 percent. Meanwhile, vegetation cover has increased from 6.5 to 12 percent.

The photo plot shows that Thurber's needlegrass has increased from 1 percent cover in 1992 to 5 percent cover in 2012. During this same time period Sandberg bluegrass increased from 2 percent to 13 percent cover. Annual fescue was not recorded in 1992 but was recorded at 2

percent cover in 2012. No cheatgrass was recorded in the photo plot in either year. Photos show sagebrush present in the photo plot in both years, but sagebrush cover was only recorded in 1992 (6% cover).

Northeast Pasture

The Northeast Pasture has two upland trend (Nested Frequency/Photo Plot) sites; one was last read in 2012 and the other in 2013.

Trend Site 11S11E18:

Site 11S11E18 (Photo 3) is located in a Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 and was re-read in 1992 (photo plot only), 1994, and 2013. The site burned in the 2006 Sailor Cap Fire and was subsequently drill seeded with a mix of Sandberg bluegrass, "Anatone" bluebunch wheatgrass, squirreltail, basin wildrye, Lewis flax, "Eski" sainfoin, and globemallow and was also aurally seeded with Wyoming big sagebrush. The site then burned again in the 2007 Murphy Complex Fire. Because the site burned and was subsequently drill seeded in 2006, comparison of the 2013 data to pre-seeding data would not be appropriate as a basis to support conclusions of overall trend; however, post-fire (2013) data is summarized in Table 11 and is described below to demonstrate the general recovery of the site after the fire.

Photo 5: Site 11S11E18; May 30, 2013



Table 11: Trend Site 11S11E18 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences
		2013
Thurber's needlegrass	4	0
Western wheatgrass	4	9
Sandberg bluegrass	1	33
Squirreltail	4	6
Cheatgrass	4	95
Forbs (<i>Perennial and Annual</i>)	4	213
Wyoming big sagebrush (<i>Mature</i>)	4	15
Yellow rabbitbrush (<i>Seedling</i>)	4	2

The key species at the site are Thurber's needlegrass and western wheatgrass. Plot 4 was used to document the number of occurrence for both key species. Thurber's needlegrass was not present along the five transects in 2013 and western wheatgrass was recorded at 9 occurrences. Squirreltail was recorded at 6 occurrences (plot 4). Sandberg's bluegrass was seeded at the site following the 2006 fire and was recorded at 33 occurrences (plot 1) in 2013. Bluebunch wheatgrass was not recorded at the site despite being seeded after the 2006 fire. Meanwhile, cheatgrass was documented at 95 occurrences (plot 4) in 2013.

Total occurrences of forbs at the site in 2013 was 285 (plot 4), which included 213 occurrences of annual forbs and 72 occurrences perennial forbs (6 species of perennial forbs and 4 species of annual forbs). The only common perennial forb at the site was sagebrush phlox. Meanwhile, all annual forb species were common at the site. Annual forbs included maiden blue eyed Mary (*Collinsia parviflora*), spring draba (*Draba verna*), tall annual willowherb, and tall tumbled mustard (*Sisymbrium altissimum*).

The 2006 Sailor Cap Fire removed the majority of sagebrush from the site. Following the fire, the site was aerielly seeded with Wyoming sagebrush. Field notes from the 2013 reading indicate that mature Wyoming big sagebrush (15 occurrences), as well mature yellow rabbitbrush (2 occurrences) were encountered along the five transects.

Cover data collected in 2013 recorded 19 percent biological soil crust, 6.5 percent shrubs, 3 percent vegetation, 63 percent litter, and 8 percent bare ground.

Four mature squirreltail plants were rooted within the 3x3 photo plot in 2013 which provided 1 percent of the cover. Cover provided by Sandberg bluegrass was recoded at 14 percent. Meanwhile, cheatgrass comprised 3 percent of the cover in 2013. Perennial forbs were recorded at 1.5 percent of cover while annual forbs comprised 0.8 percent of the live vegetation cover in 2013.

Trend Site 11S10E24:

Site 11S10E24 (Photo 6) is located within the Loamy 8-12” Wyoming big sagebrush/bluebunch wheatgrass/Thurber’s needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 and was re-read in 1993 and 2012. The 3x3 photo plot was read for the first time in 1993. The site burned in the 2007 Murphy Complex Fire and was subsequently aerially seeded with Wyoming big sagebrush. Upland trend data for the site is summarized in Table 12 and is also described below.

Photo 6: Site 11S10E24; May 23, 2012



Table 12: Trend Site 11S10E24 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1989	1993	2012
Western wheatgrass	1	37	28	43
Sandberg bluegrass	1	35	54	40
Bluebunch wheatgrass	4	0	0	2
Basin wildrye	4	0	0	3
Cheatgrass	4	0	0	50
Annual fescue	4	0	0	35
Forbs (<i>Perennial and Annual</i>)	4	63	330	296
Wyoming big sagebrush (<i>Mature</i>)	4	5	45	0
Wyoming big sagebrush (<i>Seedling</i>)	4	5	0	0
Yellow rabbitbrush	4	7	29	1

The key species at the site are western wheatgrass and Sandberg bluegrass. Plot 1 was used to record the number of occurrences of both key species. Western wheatgrass has remained static at the site and was recorded at 37 occurrences in 1989, 28 in 1993, and 43 occurrences in 2012. Sandberg bluegrass has also remained static and was recorded at 35 occurrences in 1989, 54 in 1993, and 40 occurrences in 2012. Other perennial grass species were not recorded in the 1989 or 1993 data while bluebunch wheatgrass was recorded at 2 occurrences and basin wildrye was recorded at 3 occurrences (plot 4 for both species) in 2012.

Annual grasses were recorded for the first time at 85 occurrences in 2012. Annual grasses present at the site included cheatgrass (50 occurrences in plot 4) and annual fescue (35 occurrences in plot 4).

Total occurrences of forbs have increased at the site from 63 occurrences (62 perennial and 1 annual) in 1989 to 296 (121 perennial and 175 annual) in 2012 (plot 4). While the total occurrences have increased, the 1989 data only recorded 1 species of annual forb (1 occurrence of pale agoseris). In 2012, 9 species of perennial forbs and 9 species of annual forbs were observed. Common perennial forbs at the site included longleaf phlox, sagebrush phlox, and shaggy fleabane (*Erigeron pumilus*). Common annual forbs included annual agoseris (*Agoseris heterophylla*), spring draba, and tall annual willowherb.

Field notes from the 2012 reading indicate that Wyoming big sagebrush was not present at the site following the 2007 fire, and very little rabbitbrush was present (1 occurrence).

Ground cover of biological soil crusts were not recorded in 1989 or 1993 but were recorded at 1.5 percent cover in 2012. Bare ground has remained static at 22 percent in 1989 and 21 percent in 2012. During this same time period, litter cover has also remained static at 60 and 56 percent. Additionally, vegetation cover has also remained static at 18 percent in 1989 and 20 percent in 2012.

Cover of western wheatgrass in the 3x3 photo plot increased from 0.6 percent in 1993 to 5.7 percent in 2012. Sandberg bluegrass cover also increased from 4.2 to 13.6 percent during this same time. Sagebrush and green rabbitbrush seedlings were rooted in the plot in 1993 but neither species were recorded in 2012 following the 2007 fire. The amount of phlox in the plot increased from 1.2 percent in 1993 to 2 percent in 2012.

Southwest Pasture

The Southwest Pasture has two upland trend (Nested Frequency/Photo Plot) sites; both sites were last read in 2012.

Trend Site 12S10E03:

Site 12S10E03 is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 (Photo 7) and again in 1994 and 2012 (Photo 8). The photo plot was read for the first time in 1992. The site burned in the 2012 Horse Butte Fire and was subsequently drill seeded with a mix of "Anatone" bluebunch wheatgrass, Sherman big bluegrass, squirreltail, "Eski" sainfoin, western yarrow, and "Ladak" alfalfa. In addition, Wyoming big sagebrush was aerially seeded and seedlings were hand planted in patches in the burned area. Trend data was collected in 2012 prior to the Fire. Upland trend monitoring has not occurred at the site since the 2012 fire; therefore, the following discussion provides a description of trend data prior to the 2012 fire. The upland trend data for the site is summarized in Table 13 and is also described below. It is important to note that the site has been altered significantly due to the fire and subsequent drill seeding.

Photo 7: Site 12S10E03; May 2, 1989



Photo 8. Site 12S10E03; May 21, 2012

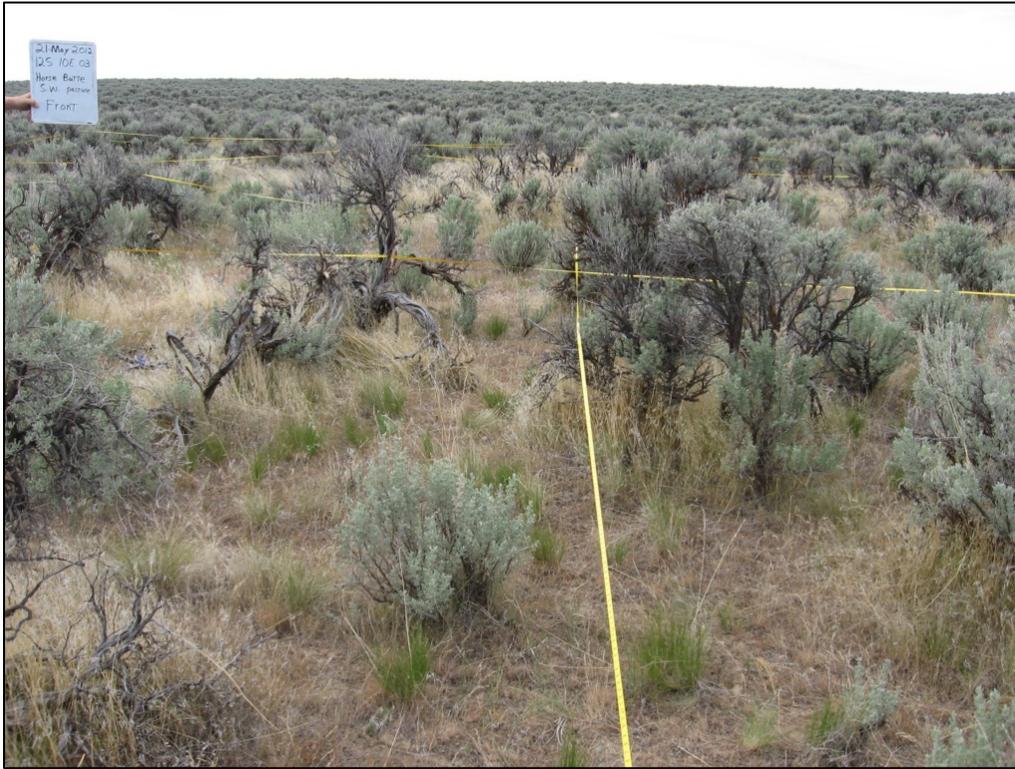


Table 13: Trend Site 12S10E03 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1989	1994	2012
Thurber's needlegrass	4	29	62	46
Sandberg bluegrass	1	28	27	45
Squirreltail	3	53	38	3
Western wheatgrass	4	0	31	55
Cheatgrass	1	0	13	51
Annual fescue	4	0	0	46
Forbs (<i>Perennial and Annual</i>)	4	90	95	108
Wyoming big sagebrush (<i>Mature</i>)	4	20	27	20
Wyoming big sagebrush (<i>Seedling</i>)	4	4	9	3

The key species at the site is Thurber's needlegrass and plot 4 is used to compare the number of occurrences between years. The frequency of Thurber's needlegrass increased from 29 occurrences in 1989 to 46 occurrences in 2012; although the highest recording came in 1994 at 62 occurrences. Sandberg bluegrass occurrences have increased over that same time period from 28 occurrences in 1989 and 27 in 1994 to 45 occurrences in 2012. Meanwhile, squirreltail decreased from 53 occurrences (plot 3) in 1989 to 3 occurrences in 2012. In addition, western wheatgrass was not recorded at the site in 1989 but 55 occurrences were recorded in 2012 (plot 4). Data was collected May 2 in 1989 while grasses were small in stature and lacking seed heads, making identification of grass species difficult (as shown in the 1989 photos). This may have

resulted in a misidentification between squirreltail and western wheatgrass in 1989. This observation was also noted on the 1994 data sheets.

Annual grasses were first recorded at the site in 1994. Cheatgrass increased from 13 occurrences (plot 1) in 1994 to 51 occurrences in 2012. Annual fescue was first recorded at the site in 2012 at 46 occurrences (plot 4).

Total occurrences of forbs at that site have increased from 90 occurrences (plot 4, all perennial) in 1989 to 108 occurrences (61 perennial and 47 annual) in 2012. In 2012, 5 species of perennial forbs and 8 species of annual forbs were recorded. Common perennial forbs at the site included longleaf phlox and sagebrush phlox while the only common annual forb was nodding chickweed (*Cerastium nutans*).

Sagebrush remained static at the site with 24 occurrences in 1989 and 23 occurrences in 2012 (plot 4). No other shrubs have been recorded at the site.

Ground cover of biological soil crusts were not recorded in 1989 or 1994, but were recorded at 9 percent of cover in 2012. Bare ground decreased from 43 percent in 2008 to 5.5 percent in 2013. During this same time period, litter cover has increased from 5.7 to 52 percent; however, vegetation cover has decreased from 51.1 to 33.3 percent. Meanwhile, biological soil crusts were not recorded at the site in 2008 but comprised 9 percent of the ground cover in 2013.

Thurber's needlegrass plants within the 3x3 photo plot increased from 8 plants in 1992 to 10 in 2012. Cover of Thurber's needlegrass also increased within the photo plot from 1.1 percent to 2.2 percent. One squirreltail plant was recorded in the photo plot in 1992 but was not recorded in 2012. Sandberg bluegrass cover increased from 3.5 percent to 4.2 percent over this same time period. Longleaf phlox cover also increased from 0.9 percent to 1.3 percent. Cheatgrass was not present in 1992 but was recorded in 2012 at 0.6 percent of cover. Wyoming big sagebrush plants rooted in the plot increased from 3 to 6 with cover increasing from 5.6 percent to 7.7 percent.

Trend Site 12S10E10:

Site 12S10E10 is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 (Photo 9) and was re-read in 1992 (photo plot only), 1993, and 2012 (Photo 10). The photo plot was read for the first time in 1992. The site burned in the 2013 Horse Butte 2 Fire and was subsequently drill seeded with a mix of "Anatone" bluebunch wheatgrass, Sandberg bluegrass, squirreltail, "Eski" sainfoin, western yarrow, and "Ladak" alfalfa. In addition, Wyoming big sagebrush was aerially seeded across the entire burned area and seedlings were hand planted in patches. Upland trend monitoring has not occurred at the site since the 2013 fire; therefore, the following discussion provides a description of trend data prior to the 2013 fire. The upland trend data for the site is summarized in Table 14 and is also described below. It is important to note that the site has been altered significantly due to the fire and subsequent drill seeding.

Photo 9: Site 12S10E10; May 2, 1989



Photo 10: Site 12S10E10; May 21, 2012

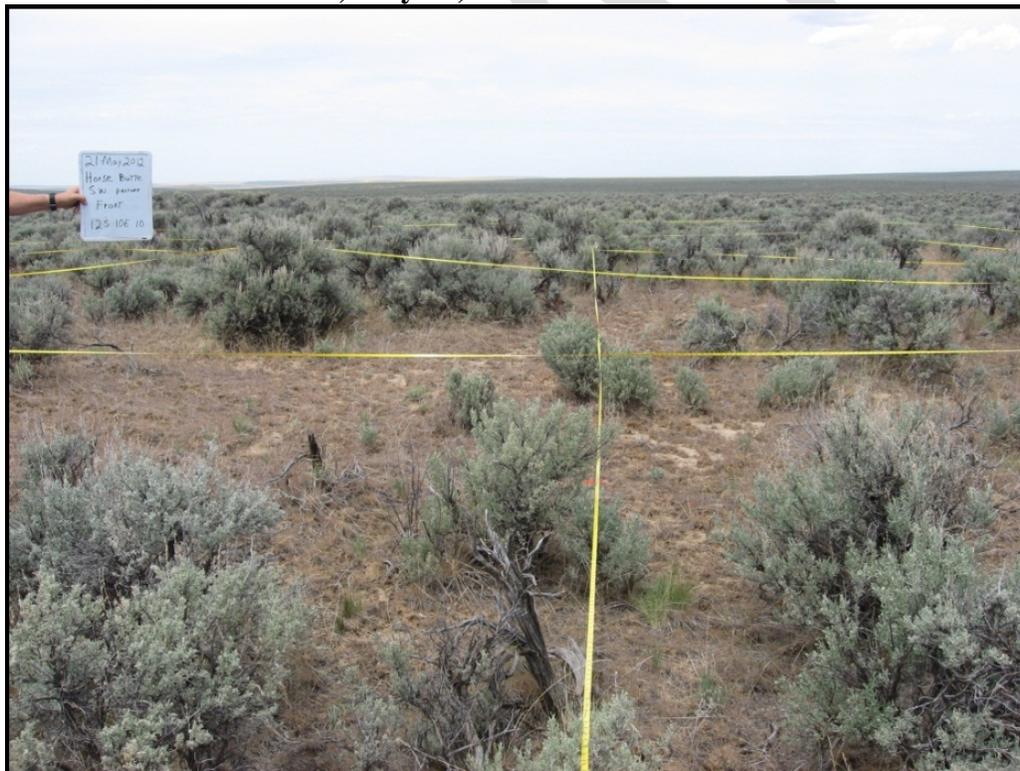


Table 14: Trend Site 12S10E10 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1989	1993	2012
Thurber's needlegrass	4	3	2	5
Sandberg bluegrass	1	24	37	38
Squirreltail	4	58	40	44
Cheatgrass	4	0	0	12
Annual fescue	4	0	0	21
Forbs <i>Perennial and Annual</i>)	4	60	259	112
Wyoming big sagebrush (<i>Mature</i>)	4	54	50	34
Wyoming big sagebrush (<i>Seedling</i>)	4	2	0	2

Key species at the 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 remained static, with 3 occurrences in 1989 and 5 occurrences in 2012. Occurrences of Sandberg bluegrass increased from 24 occurrences to 38 occurrences over that same time period. Squirreltail has decreased from 58 occurrences in 1989 to 44 occurrences in 2012 (plot 4).

Annual grasses have increased from zero occurrences in both 1989 and 1993 to 33 occurrences in 2012. The 2012 data indicates that cheatgrass (12 occurrences) and annual fescue (21 occurrences) are both present in small amounts at the site (both plot 4).

The total occurrences of forbs at that site have increased from 60 occurrences (all perennial) in 1989 to 112 occurrences (53 perennial and 59 annual) in 2012. While the total occurrences have increased, the 1989 data did not record annual species. In 2012, 3 species of perennial forbs and 7 species of annual forbs were observed. Common perennial forbs at the site included longleaf phlox and sagebrush phlox. Common annual forbs included small blue eyed Mary and spring draba. Mature shrubs decreased at the site from 54 occurrences in 1989 to 34 occurrences in 2012.

Ground cover of biological soil crusts were not recorded in 1989 or 1993 . but were recorded at 21 percent of cover in 2012. Bare ground decreased from 59 percent in 1989 to 20 percent in 2012. During this same time period, litter cover has slightly decreased from 35 to 28 percent; however, vegetation cover has increased from 6 to 12 percent.

The number of Thurber's needlegrass within the 3x3 photo plot stayed static at 6 plants from 1992 to 2012. Meanwhile, cover of Thurber's needlegrass within the photo plot increased from 0.6 percent to 1.6 percent over that same time period. In 1992, there were two squirreltail plants in the photo plot, providing 0.2 percent of the live vegetation cover. While only one squirreltail plant was recorded in 2012, it provided 0.4 percent cover. Sandberg bluegrass cover increased from 4.6 percent in 1992 to 7.8 percent in 2012. Annual grasses were not found within the photo plot in either year. Two Wyoming sagebrush plants are rooted in the plot; however, sagebrush cover decreased from 8 percent in 1992 to 2 percent in 2012. Forbs were not recorded in 1992

but were recorded at 0.8 percent cover in 2012. Photos taken in 1992 and then in 2012 show an obvious decrease in the amount of bare ground.

Southeast Pasture

The Southeast Pasture has one upland trend (Nested Frequency/Photo Plot) site on public land; the site was last read in 2012.

Trend Site 12S11E06A:

Site 12S11E06A is located within the Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) ecological site. The site was initially read in 1989 (Photo 11) and was re-read in 1993 and 2012 (Photo 12). The photo plot was read for the first time in 1993. The site burned in the 1973 Horse Butte Fire and the 2007 Murphy Complex Fire. Wyoming big sagebrush was aerially seeded after the Murphy Complex Fire. Upland trend data for the site is summarized in Table 15 and is also described below.

Photo 11: Site 12S11E06A; May 3, 1989



Photo 12: Site 12S11E06A; May 22, 2012



Table 15: Trend Site 12S11E06A Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1989	1993	2012
Thurber's needlegrass	4	33	34	1
Western wheatgrass	1	19	22	12
Sandberg bluegrass	1	41	33	69
Squirreltail	4	0	1	24
Cheatgrass	4	0	89	0
Annual fescue	4	0	0	4
Forbs (<i>Perennial and Annual</i>)	4	90	330	417
Wyoming big sagebrush (<i>Mature</i>)	4	1	8	0
Yellow rabbitbrush (<i>Seedling</i>)	4	0	21	3
Rubber rabbitbrush (<i>Mature</i>)	4	0	0	4

The key species at the site are Thurber's needlegrass and western wheatgrass. Plot 4 was used to count the number of occurrences for Thurber's needlegrass and plot 1 was used for western wheatgrass. Thurber's needlegrass has declined from 33 occurrences in 1989 and 34 occurrences in 1993 to 1 occurrence in 2012. Western wheatgrass was recorded at 19 occurrences in 1989 and 12 occurrences in 2012. Sandberg bluegrass was recorded at 41 occurrences in 1989 and 69 occurrences in 2012 (plot 1). Squirreltail was first recorded in 1993 at 1 occurrence and increased to 24 occurrences in 2012 (plot 4).

Cheatgrass was not recorded at the site in 1989, was prevalent at the site in 1993 at 89 occurrences (plot 4), and was again not recorded at the site in 2012. Annual fescue was not recorded at the site in 1989 or 1993 but was recorded at 4 occurrences in 2012 (plot 4).

The total occurrences of forbs at the site have increased from 90 occurrences (88 perennial and 2 annual) in 1989 to 417 (129 perennial and 288 annual) in 2012 (plot 4). While the total occurrences have increased, the 1989 data only recorded 1 species of annual forb (2 occurrences of agoseris). In 2012, 10 species of perennial forbs and 11 species of annual forbs were observed. Common perennial forbs included longleaf phlox and sagebrush phlox. Common annual forbs included clasping pepperweed (*Lepidium perfoliatum*), curvseed butterwort (*Ceratocephala testiculata*), maiden blue eyed Mary, slender phlox, spring draba, and tall annual willowherb.

Shrubs (rabbitbrush) were recorded at 7 occurrences at the site in 2012 (plot 4). Sagebrush was not encountered along the five transects; however, photos show some Wyoming big sagebrush plants at the site.

Ground cover of biological soil crusts were not recorded in 1989 or 1993 but were recorded at 10 percent of cover in 2012. Bare ground decreased from 48 percent in 1989 to 26 percent in 2012. During this same time period, litter cover has decreased from 44 to 24 percent; however, vegetation cover has increased from 8 to 18.5 percent.

Five mature Thurber's needlegrass plants were rooted within the 3x3 photo plot in 1993 but were not observed in 2012. Western wheatgrass cover declined within the photo plot from 1.8 percent to 0.3 percent over the same time period. Sandberg's bluegrass also declined from 5.6 percent to 0.4 percent. The amount of cover for cheatgrass and annual forbs increased from 0.1 percent to 0.4 percent and 0.2 percent to 0.5 percent, respectively. Green rabbitbrush was not rooted in the plot in 1993, but provided 1 percent of the cover in 2012.

IDAHO RANGELAND HEALTH STANDARDS ASSESSMENT

There are eight standards for rangeland health that apply to BLM lands in the state of Idaho. Not all of the Standards apply to the Horse Butte AMP Allotment due to variances in the land type and geographical area. Of the eight Idaho Standards for Rangeland Health, the following standards are applicable to the Horse Butte AMP Allotment.

- **Standard 1** – 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.
- **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 and endangered, sensitive, and other special status species.

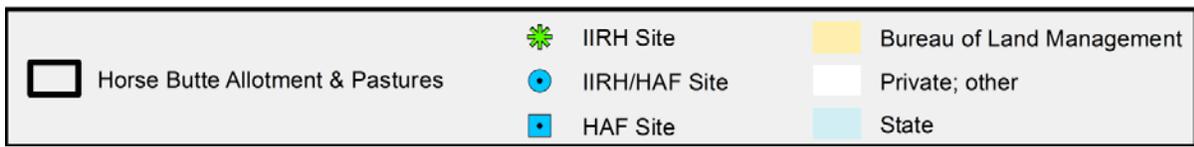
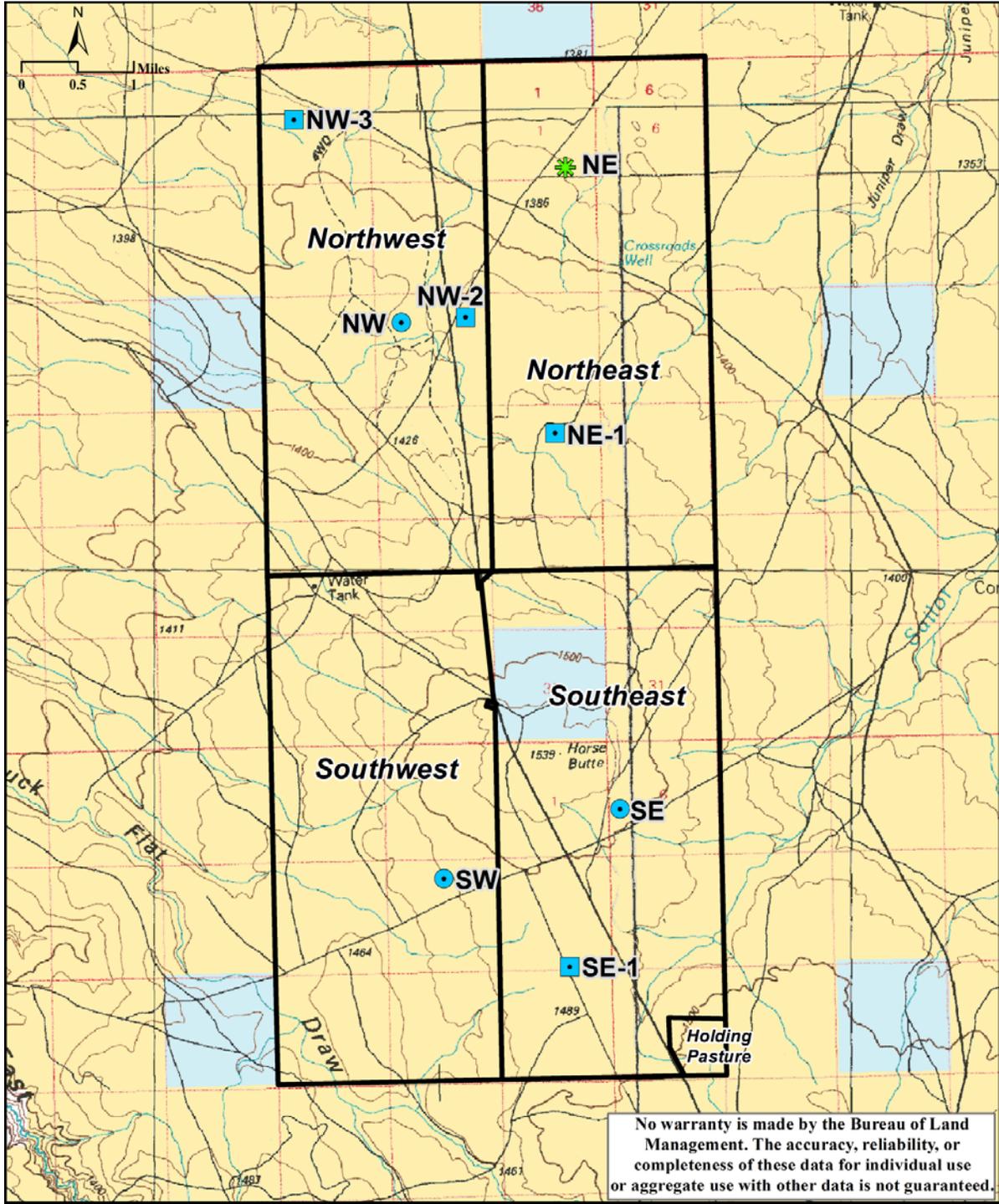
**Standards 2, 3, 5, and 6 do not apply to the Horse Butte AMP Allotment*

Table 16: Standards Applicable to the Horse Butte AMP Allotment by Pasture.

Standard	Pastures
1	All Pastures (Northwest, Northeast, Southwest, Southeast)
2	Not applicable
3	Not applicable
4	All Pastures (Northwest, Northeast, Southwest, Southeast)
5	Not applicable
6	Not applicable
7	All Pastures (Northwest, Northeast, Southwest, Southeast)
8	All Pastures (Northwest, Northeast, Southwest, Southeast)

An interdisciplinary (ID) team conducted IIRH field evaluations at four sites representative of the plant communities within the Horse Butte AMP Allotment during June and July of 2013 (Map 7). The Northwest, Northeast, Southwest, and Southeast Pastures each contain one site. All four sites were located in areas of native plant communities. However, the site in the Northeast Pasture burned in 2006 and 2007 and the site in the Southeast Pasture burned in 2007. The site in the Southwest Pasture burned in 2013 and was subsequently drill seeded with a native-like seed mix. Because the site in the Southwest Pasture burned after the IIRH field evaluation, the pasture will be assessed for pre-fire conditions as a native plant community. Of the four sites at which IIRH evaluations were conducted, three were sage-grouse Habitat Assessment Framework (HAF) sites and one was an Ecological Site Inventory (ESI) site.

Map 7: Interpreting Indicators of Rangeland Health (IIRH) and Sage-grouse Habitat Assessment Framework (HAF) 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 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 17) were used to evaluate three rangeland health attributes (Table 18): 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 sites following the line point intercept method as described in the Sage-grouse Habitat Assessment Framework (BLM 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. Cover data was collected at the IIRH site in the Northeast Pasture following the step-point method (BLM, 1996).

In addition to evaluating rangeland health indicators at each of the four IIRH sites, the ID Team also examined other areas to ensure evaluation sites were representative of the vegetation communities throughout each pasture. Data collected at the evaluation sites were compared to the Natural Resource Conservation Service's (NRCS) ESD reference sheet for the soil types and potential vegetation communities in the Horse Butte AMP Allotment. All IIRH sites within the allotment occurred in the Loamy 8-12" Wyoming Big Sagebrush/Bluebunch wheatgrass/Thurber's needlegrass ecological site. The ESD reference sheet describes the expected condition of the ecological site in state 1, phase A of the reference state.

The Loamy 8-12" Wyoming big sagebrush/bluebunch wheatgrass/Thurber's needlegrass (R011XY001ID) reference phase plant community is expected to have Wyoming big sagebrush in the overstory with bluebunch wheatgrass dominating the understory. Thurber's needlegrass should be the subdominant grass. Other significant species included in the ESD are Sandberg bluegrass, squirreltail, and arrowleaf balsamroot. There can be a variety of other grasses, forbs, and shrubs in minor amounts. The natural fire frequency should be 50-70 years.

Indicator ratings for each IIRH site in the Horse Butte AMP Allotment are shown in Table 17. Rangeland health attributes ratings are shown in Table 18.

Table 17: Summary of 17 rangeland health indicators

Indicators	Attributes	Degree of Departure from Ecological Site Description and/or Ecological Reference Area(s)				
	S = Soil & Site Stability H=Hydrologic Function B = Biotic Integrity	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills	S, H					NE, NW, SE, SW
2. Water-flow Patterns	S, H					NE, NW, SE, SW
3. Pedestals and/or terracettes	S, H					NE, NW, SE, SW
4. Bare ground	S, H					NE, NW, SE, SW
5. Gullies	S, H					NE, NW, SE, SW
6. Wind-scoured, blowouts, and/or deposition areas	S					NE, NW, SE, SW
7. Litter movement	S					NE, NW, SE, SW
8. Soil surface resistance to erosion	S, H, B					NE, NW, SE, SW
9. Soil surface loss or degradation	S, H, B				NE	NW, SE, SW
10. Plant community composition and distribution relative to infiltration	H				NE	NW, SE, SW
11. Compaction layer	S, H, B					NE, NW, SE, SW
12. Functional/structural groups	B			NE		NW, SE, SW
13. Plant mortality/decadence	B					NE, NW, SE, SW
14. Litter amount	H, B			NE, SE, SW	NW	
15. Annual production	B					NE, NW, SE, SW
16. Invasive plants	B		NE	SE	NW, SW	
17. Reproductive capability of perennial plants	B					NE, NW, SE, SW

NE = Northeast Pasture site, NW = Northwest Pasture site, SE = Southeast Pasture site, SW = Southwest Pasture site

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 17 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 18.

Table 18: 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					NW, NE, SW, SE
Hydrologic Function				NE	NW, SW, SE
Biotic Integrity			NE	SE	NW, SW

NE = Northeast Pasture site, NW = Northwest Pasture site, SE = Southeast Pasture site, SW = Southwest Pasture site

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

The IIRH sites (NW, NE, SW, SE) were evaluated using the ESD (R011XY001ID) reference sheet for the Loamy 8-12” Wyoming big sagebrush/bluebunch wheatgrass/Thurber’s needlegrass ecological site (USDA and NRCS, 2013a). The reference sheet for the ESD indicates bare ground should range from 30 to 40 percent cover (top layer), litter should range from 5 to 10 percent (cover for all layers), and the soil stability test value should range from 4 to 6. 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 to 10 percent, ESI and HAF data collected within the allotment show that litter values actually range from 14.5 to 70 percent cover for all layers. 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 2004 cover and production data, the 2006 ESI data, as well as the 2012 and 2013 HAF data (Tables 19 – 22) ranges from 3.5 to 28.0 percent cover (top layer). In addition, a soil stability test (Pellant et al., 2005) was completed within the Northwest Pasture and resulted in an average soil stability value of 4.7, indicating adequate soil surface resistance to erosion (Photo 13).

Photo 13: Soil profile in the Northwest Pasture



Multiple soil series exist within the Horse Butte AMP Allotment and are typically silt loams. The majority of the allotment is relatively flat. The Soil Survey Geographic (SSURGO) Database (NRCS 2012) shows that 3 percent of the allotment has a severe wind erosion hazard, 80 percent has a moderate wind erosion hazard, and 17 percent has a slight wind erosion hazard. In addition, the soil survey shows that 78 percent of the allotment has a high water erosion hazard and 22 percent has a medium water erosion hazard.

Although the soil survey shows potential for both wind and water erosion in this area, no indications of active erosion or soil loss were noted during the 2013 IIRH field visits. Adequate soil cover is present within the allotment to reduce potential erosion. Abundant perennial vegetation, as well as some biological soil crusts, are present to provide protection for site stability throughout the majority of the allotment (Tables 19 – 22).

Table 19: Percent ground cover (top layer) at IIRH sites

Ground Cover	IIRH Site NW	IIRH Site NE	IIRH Site SW	IIRH Site SE
	Northwest Pasture	Northeast Pasture	Southwest Pasture	Southeast Pasture
Perennial Grasses	39.0%	34.0%	30.5%	49.0%
Annual Grasses	2.5%	4.0%	8.5%	1.0%
Perennial Forbs	2.5%	0.0%	1.0%	8.0%
Annual Forbs	0.0%	0.0%	0.0%	0.5%
Unidentified Forbs*	0.0%	6.0%	0.0%	0.0%
Shrubs	18.5%	0.0%	27.0%	4.5%
Biological Soil Crust	2.5%	4.0%	10.5%	3.5%

Ground Cover	IIRH Site NW	IIRH Site NE	IIRH Site SW	IIRH Site SE
	Northwest Pasture	Northeast Pasture	Southwest Pasture	Southeast Pasture
Bare Ground	15.0%	24.0%	7.5%	3.5%
Litter	19.5%	28.0%	14.5%	30.0%
Rock	0.5%	0.0%	0.5%	0.0%

*Forbs recorded along the transect in the Northeast Pasture were not recorded by species

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. Percentages of litter used to evaluate the litter indicator included not only detached litter in contact with soil, but also standing litter.

Northwest Pasture

IIRH Site NW (Loamy 8-12")

Site NW is located in a native vegetation community where Thurber's needlegrass is the dominant grass species (20% cover) and Wyoming big sagebrush is the dominant shrub species (18.5% cover). Biological soil crusts comprise 2.5 percent cover (Table 19) at the site. The site is of relatively flat topography and has not burned by wildfire in over 50 years. A soil stability test (Pellant et al., 2005) was completed at the site during IIRH and the soil stability value averaged 4.7, indicating adequate soil surface resistance to erosion.

The indicator for litter amount was rated a slight to moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

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

Northeast Pasture

IIRH Site NE (Loamy 8-12")

Site NE is located in a native vegetation community that has burned twice in the past 50 years. The site burned in the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire. The fires nearly eliminated sagebrush from the site. Some low density sagebrush has established as a result of rehabilitation efforts. Sandberg bluegrass is the dominant species (30.0% cover) at the site. In addition, biological soil crusts comprise 4.0 percent of cover (Table 19).

The indicator for soil surface loss or degradation was rated at a slight to moderate departure from the reference condition due to some evidence of soil loss. Field notes indicate that some soil loss appeared to have occurred following the 2006 and 2007 wildfires as evidenced through some slight pedestalling. It was also noted that soil loss did not appear to be active.

The indicator for plant community composition and distribution relative to infiltration was rated slight to moderate departure from the reference condition due to the low abundance of deep rooted perennial bunchgrasses at the site. Field notes indicate that shrubs are increasing at the site.

The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (40% cover for all layers) found at the site.

The other indicators related to the Soil and Site Stability and Hydrologic Function attributes were rated none to slight departure from the reference condition. The Soil and Site Stability attribute was rated at none to slight departure from the reference condition for the site; however, the Hydrologic Function attribute was rated slight to moderate due to the combination of evidence of past soil loss and a low abundance of deep-rooted perennial bunchgrasses.

Southwest Pasture

IIRH Site SW (Loamy 8-12")

At the time of the IIRH field evaluation, site SW was located in a native vegetation community where Sandberg bluegrass was the dominant grass species (20.5% cover) and Wyoming big sagebrush was the dominant shrub species (27.0% cover). Biological soil crusts comprised 10.5 percent of cover (Table 19). However, the site burned in the 2013 Horse Butte 2 Fire and was subsequently drill seeded with a native-like seed mix. Because the site burned after the IIRH field evaluation, and because it was seeded with a native-like seed mix, the pasture is assessed for pre-fire conditions as a native plant community.

Monitoring data and field notes collected in the spring of 2014 within the area burned by the 2013 Horse Butte 2 Fire showed good establishment of seeded species. In addition, cover values for Sandberg bluegrass and squirreltail show recovery of on-site native plants. Other on-site natives, including western wheatgrass and a variety of forbs, also showed good recovery within the burned area. Some sagebrush seedlings were observed as scattered individuals. Overall, the first year monitoring indicated good establishment of seeded species and recovery of native species, despite the dry conditions of spring 2014. The low amount of sagebrush seedlings is not unusual for first year monitoring.

The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

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

Southeast Pasture

IIRH Site SE (Loamy 8-12")

Site SE is located in a native vegetation community that has burned twice in the past 50 years; the 1973 Horse Butte Fire and the 2007 Murphy Complex Fire. The fires essentially removed sagebrush and other shrubs from the site. Sandberg bluegrass is the dominant species (31.5% cover) at the site. In addition, biological soil crusts comprise 3.5 percent of cover (Table 19).

The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

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

Allotment Summary for Standard 1 (Watersheds)

The attributes of rangeland health related to Standard 1 are Soil and Site Stability and Hydrologic Function. The Soil and Site Stability attribute was rated none to slight departure for all four sites in the allotment. Meanwhile, the Hydrologic Function attribute was rated none to slight at three of the sites (Sites NW, SW, and SE) and slight to moderate at one site (Site NE).

The indicator for soil surface loss or degradation was rated as a slight to moderate departure at site NE due to some evidence of past, inactive soil loss. Site NE was also rated as slight to moderate for the plant community composition and distribution relative to infiltration indicator due to the low abundance of deep rooted perennial bunchgrasses. Meanwhile, the litter amount indicator was rated slight to moderate departure at site NW and moderate at sites NE, SW, and SE due to the increased amount of litter. A soil stability test as described in technical reference 1734-6 (Pellant et al., 2005) was completed at evaluation site NW with an average stability value of 4.7, indicating adequate soil surface resistance to erosion.

Evaluation of Standard 1

Some evidence of soil loss was observed at the site within the Northeast Pasture. Field notes indicate that some soil loss may have occurred following the 2006 and 2007 wildfires, as evidenced through some slight pedestalling. It was also noted that the pedestalling was minor and did not appear to be active; therefore, the indicator for pedestals and/or terracettes was rated none to slight.

The site within the Northeast Pasture was rated slight to moderate departure for plant community composition and distribution relative to infiltration and runoff due to the low abundance of deep-rooted perennial bunchgrasses at the site.

The amount of litter found within the allotment is higher than what is described in the ESD. However, litter is providing cover for site protection, and replenishing nutrients, and does not appear to be negatively affecting ecological processes.

The Soil and Site Stability attribute was rated none to slight departure from the reference condition for all four sites within the allotment. The Hydrologic Function attribute was rated slight to moderate at the site in the Northeast Pasture due to the combination of some evidence of past soil loss and a low abundance of deep-rooted perennial bunchgrasses. Meanwhile, the Hydrologic Function attribute was rated none to slight at the remaining three sites.

Evaluation Finding – Allotment is:

X Meeting the Standard

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

Rationale for Evaluation Finding

Abundant perennial vegetation, as well as some biological soil crusts, is present within the Horse Butte AMP Allotment to provide protection for site stability. Additionally, bare ground is lower than expected throughout the allotment and topography is relatively flat.

Observations made by the ID Team during 2013 IIRH efforts, as well as cover data (Tables 19 – 22) and upland trend data (Tables 9 – 15) collected within each pasture of the Horse Butte AMP Allotment indicate that ground cover (vegetation, biological soil crusts, litter, etc.) is sufficient for soil stability. Within recently burned areas, biological soil crusts are generally of lower abundance; however, adequate vegetation and litter are present to protect the soil surface from erosion. While some evidence of past soil loss, in the form of slight pedestal formation, was observed within the Northeast Pasture, pedestals were noted to be minor and inactive. It was also noted that the minor soil loss likely occurred after the site burned in consecutive years in 2006 and 2007. Additionally, no signs of soil loss, or active pedestal formation, were noted in any other areas of the allotment. Moreover, other signs of accelerated erosion, such as active rills, water flow patterns, gullies, or other indications of soil erosion were not present within the allotment. Infiltration, retention, and release of water processes relative to soil, vegetation, climate and landform are providing for appropriate nutrient and hydrologic cycling and energy flow.

Due to recent wildfires (2006, 2007, 2012, and 2013), shrubs are of lower abundance within some plant communities of the allotment. Wildfire has essentially eliminated shrubs in these areas, although some remnant mature plants remain unburned and recruitment of seedlings is occurring. Shrubs trap snow and have a taproot that penetrates deep into the soil profile; therefore, the lack of shrubs has the potential to affect infiltration and retention of soil moisture. However, some shrub species, as well as abundant deep-rooted perennial bunchgrasses, are present to carry soil moisture deep into the soil profile. Furthermore, although wildfire has effectively removed the above-ground biomass of the shrubs, it is likely that some root structure is still present to assist infiltration deep into the soil profile. In addition, perennial grasses appeared vigorous and were producing seedheads at all sites, suggesting that the reduction of shrub cover is not negatively affecting infiltration to the point of reducing plant vigor or reproductive capability.

A low abundance of deep-rooted perennial bunchgrasses were noted at one site within the Northeast Pasture. A reduced abundance of deep-rooted perennial bunchgrasses has the potential to affect infiltration and retention of soil moisture. The site was burned by the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire and was not seeded in past vegetation treatments. However, it was noted during the 2013 IIRH field evaluation that shrubs are increasing at the site, which helps to capture and store precipitation, and facilitate the infiltration of moisture deeper into the soil profile. Moreover, deep-rooted perennial bunchgrasses are abundant throughout most areas of the allotment.

The litter amount indicator ratings deviated from the reference condition found in the ESD at each of the four sites. However, litter is providing cover for site protection, replenishing nutrients, and does not appear to be negatively affecting ecological processes.

Overall, upland trend data within the allotment show that bare ground has decreased over time (Tables 9 – 15). In addition, litter cover has generally remained static in most areas. Cover of live vegetation has increased or remained static at all but one upland trend site within the allotment. Biological soil crusts are shown in the most recent data 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.

X Standard Doesn't Apply

All streams within the Horse Butte 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 allotment. Therefore, Standard 2 does not apply to the Horse Butte AMP Allotment.

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.

X Standard Doesn't Apply

All streams within the Horse Butte 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 allotment. Therefore, Standard 3 does not apply to the Horse Butte AMP Allotment.

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

Each pasture of the Horse Butte AMP Allotment is evaluated under Standard 4. The majority of the Northwest, Northeast, and Southeast Pastures are dominated by native plant communities, as shown by the vegetation cover data collected in 2004, 2006, 2012, and 2013 (Tables 20 – 22). At the time of the 2013 field evaluation the Southwest Pasture was also dominated by native plant communities; however, a large portion of the pasture burned and was subsequently drill seeded later in the year. Because the majority of the Southwest Pasture has been seeded with a native-like seed mix, this pasture is also evaluated under Standard 4. Field notes recorded during the 2012 and 2013 IIRH indicate the presence of native shrubs, grasses, and forbs within the allotment. Rush skeletonweed was noted at the sites in the Northeast and Southeast Pastures during the field evaluations.

Vegetative cover data were recorded in 2012 following the Line Point Intercept method, as described in the Sage-grouse Habitat Assessment Framework (Stiver et al., 2010) protocol (HAF), at three (NW, SW, and SE) of the four IIRH sites within the allotment. Vegetative cover data was recorded at the remaining IIRH site (NE) in 2013 using the Step Point Method (BLM, 1996). This cover data is summarized below in Table 20. Vegetative cover data was collected at multiple layers; however, Table 20 displays only the top layer.

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

Ground Cover	Species	2012 Site NW (HAF)	2013 Site NE (Step)	2012 Site SW* (HAF)	2012 Site SE (HAF)
Perennial Grasses	Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	1.0%	0.0%	0.0%	0.0%
	Squirreltail (<i>Elymus elymoides</i>)	1.0%	0.0%	0.5%	0.0%
	Crested wheatgrass (<i>Agropyron cristatum</i>)	0.0%	0.0%	0.0%	0.5%
	Thurber's needlegrass (<i>Achnatherum thurberianum</i>)	20.0%	2.0%	1.5%	0.5%
	Sandberg bluegrass (<i>Poa secunda</i>)	11.0%	30.0%	20.5%	31.5%
	Western wheatgrass (<i>Pascopyrum smithii</i>)	6.0%	0.0%	8.0%	16.5%
	Thickspike wheatgrass (<i>Elymus lanceolatus</i>)	0.0%	2.0%	0.0%	0.0%
Annual Grasses	Cheatgrass (<i>Bromus tectorum</i>)	2.5%	4.0%	7.5%	1.0%
	Small fescue (<i>Vulpia microstachys</i>)	0.0%	0.0%	0.5%	0.0%
	Annual fescue (<i>Vulpia myuros</i>)	0.0%	0.0%	0.5%	0.0%
Perennial Forbs	Longleaf phlox (<i>Phlox longifolia</i>)	0.0%	0.0%	0.0%	0.5%
	Lupine (<i>Lupinus spp.</i>)	0.0%	0.0%	0.0%	5.0%
	Meadow deathcamas (<i>Zigadenus venenosus</i>)	0.5%	0.0%	0.5%	0.0%
	Mourning milkvetch (<i>Astragalus atratus</i>)	0.0%	0.0%	0.0%	1.0%

Ground Cover	Species	2012 Site NW (HAF)	2013 Site NE (Step)	2012 Site SW* (HAF)	2012 Site SE (HAF)
	Pale agoseris (<i>Agoseris glauca</i>)	0.0%	0.0%	0.5%	0.0%
	Prickly phlox (<i>Leptodactylon pungens</i>)	1.5%	0.0%	0.0%	0.0%
	Freckled milkvetch (<i>Astragalus lentiginosus</i>)	0.5%	0.0%	0.0%	0.5%
	Tall annual willowherb (<i>Epilobium brachycarpum</i>)	0.0%	0.0%	0.0%	1.0%
Annual Forbs	Clasping pepperweed (<i>Lepidium perfoliatum</i>)	0.0%	0.0%	0.0%	0.5%
Forbs	Unidentified forb species	0.0%	6.0%	0.0%	0.0%
Shrubs	Yellow rabbitbrush (<i>Chrysothamnus viscidiflorus</i>)	0.0%	0.0%	0.0%	4.5%
	Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	18.5%	0.0%	27.0%	0.0%
Vegetation Total		62.5%	44.0%	67.0%	63.0%
Other Cover;	Bare Ground	15.0%	24.0%	7.5%	3.5%
	Biological soil crust	2.5%	4.0%	10.5%	3.5%
	Litter in Contact with Soil	10.5%	28.0%	8.0%	7.5%
	Litter Standing	7.0%	0.0%	6.5%	22.5%
	Persistent Litter	2.0%	0.0%	0.0%	0.0%
	Rock or Gravel	0.5%	0.0%	0.5%	0.0%

Other plant species not recorded within the cover transects or not recorded on the top layer are listed by site in Appendix B.

*Site burned in the 2013 Horse Butte 2 Fire and was subsequently drill seeded; therefore, data shown describes pre-fire conditions.

Vegetative cover data were also recorded in other areas of the Horse Butte AMP Allotment in 2004 (production and cover), 2006 (ESI), 2012 (HAF), and 2013 (HAF). The 2006 ESI data and the 2012 and 2013 HAF data are summarized below in Table 21. In addition, the 2004 cover data is summarized below in Table 22. Vegetative cover data was collected at multiple layers; however, Tables 21 and 22 display only the top layer. Three additional cover sites were burned by wildfire and subsequently drill seeded after cover data were collected; therefore, these sites are not included in Tables 21 and 22. Data from the sites that burned and were drill seeded are available for review at the JFO.

Table 21: Percent ground cover (top layer) recorded in 2006, 2012, and 2013 in other areas of the Horse Butte AMP Allotment

Ground Cover	Species	2006 ESI RA-41	2012 HAF NW2*	2013 HAF NW3	2006 ESI IN-31^	2012 HAF NE*	2012 HAF SE1
		Northwest Pasture			Northeast Pasture		Southeast Pasture
		Perennial Grasses	Squirreltail (<i>Elymus elymoides</i>)	1.3%	4.5%	7.0%	1.3%
Sandberg bluegrass (<i>Poa secunda</i>)	24.7%		33.5%	16%	14.7%	20.0%	20.5%

Ground Cover	Species	2006 ESI RA-41	2012 HAF NW2*	2013 HAF NW3	2006 ESI IN-31^	2012 HAF NE*	2012 HAF SE1
		Northwest Pasture			Northeast Pasture		Southeast Pasture
	Thurber's needlegrass (<i>Achnatherum thurberianum</i>)	4.7%	10.0%	39%	8.7%	2.0%	0.0%
	Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	0.7%	0.0%	0.0%	0.0%	2.0%	0.0%
	Western wheatgrass (<i>Pascopyrum smithii</i>)	0.0%	8.0%	0.0%	0.0%	8.0%	1.0%
	Thickspike wheatgrass (<i>Elymus lanceolatus</i>)	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Annual Grasses	Cheatgrass (<i>Bromus tectorum</i>)	1.3%	1.0%	0.0%	10.0%	5.5%	0.5%
	Sixweeks fescue (<i>Vulpia octoflora</i>)	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%
	Small fescue (<i>Vulpia microstachys</i>)	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%
	Annual fescue (<i>Vulpia myuros</i>)	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
Perennial Forbs	Longleaf phlox (<i>Phlox longifolia</i>)	0.7%	0.5%	1.0%	1.3%	0.5%	0.0%
	Prickly lettuce (<i>Lactuca serriola</i>)	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%
	Lupine (<i>Lupinus spp.</i>)	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%
	Mourning milkvetch (<i>Astragalus atratus</i>)	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
	Prickly phlox (<i>Leptodactylon pungens</i>)	0.0%	0.0%	0.0%	0.0%	1.0%	0.5%
	Meadow deathcamas (<i>Zigadenus venenosus</i>)	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Annual Forbs	Tall tumbled mustard (<i>Sisymbrium altissimum</i>)	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%
	Tall annual willowherb (<i>Epilobium brachycarpum</i>)	0.7%	1.0%	0.0%	0.0%	0.0%	0.0%
Shrubs	Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	12.0%	0.0%	0.0%	16.0%	7.0%	29.0%
Vegetation Total		48.1%	58.5%	64.0%	54.7%	50.0%	54.5%
Other Cover	Bare Ground	16.7%	16.5%	7.0%	14.7%	12.0%	26.5%
	Biological soil crust	7.3%	3.0%	10.0%	4.0%	2.5%	10.0%
	Litter in contact with soil	28.0%	12.5%	12.0%	23.3%	6.0%	3.5%
	Litter Standing	0.0%	9.5%	7.0%	3.3%	28.5%	3.5%
	Persistent Litter	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
	Rock or Gravel	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%

*Site burned in the 2007 Murphy Complex Fire

^Site burned in the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire

Table 22: Percent ground cover (top layer) recorded in 2004 in other areas of the Horse Butte AMP Allotment

Ground Cover	Species	2004 HBC-5	2004 HBC-6	2004 HBC-8*	2004 HBC-9***	2004 HBC-4	2004 HBC-1^	2004 HBC-2
		Northwest Pasture			Northeast Pasture	Southwest Pasture	Southeast Pasture	
Perennial Grasses	Squirreltail (<i>Elymus elymoides</i>)	0%	0%	3%	5%	0%	0%	2%
	Sandberg bluegrass (<i>Poa secunda</i>)	6%	15%	18%	15%	21%	18%	8%
	Crested wheatgrass (<i>Agropyron cristatum</i>)	39%	0%	0%	0%	31%	0%	0%
	Thurber's needlegrass (<i>Achnatherum thurberianum</i>)	1%	10%	13%	12%	3%	0%	4%
	Indian ricegrass (<i>Achnatherum hymenoides</i>)	1%	0%	0%	0%	0%	0%	0%
	Thickspike wheatgrass (<i>Elymus lanceolatus</i>)	3%	2%	3%	0%	0%	6%	1%
Annual Grasses	Cheatgrass (<i>Bromus tectorum</i>)	1%	4%	4%	0%	1%	3%	1%
	Sixweeks fescue (<i>Vulpia octoflora</i>)	1%	2%	0%	0%	0%	0%	0%
Perennial Forbs	Longleaf phlox (<i>Phlox longifolia</i>)	3%	3%	7%	4%	0%	4%	4%
	Carpet phlox (<i>Phlox hoodii</i>)	0%	0%	0%	0%	1%	0%	0%
	Lupine (<i>Lupinus spp.</i>)	0%	0%	0%	0%	0%	1%	0%
	Arrowleaf balsamroot (<i>Balsamorhiza sagittata</i>)	0%	0%	0%	1%	0%	0%	0%
	Mourning milkvetch (<i>Astragalus atratus</i>)	1%	0%	0%	0%	0%	0%	0%
	Milkvetch (<i>Astragalus spp.</i>)	1%	0%	0%	0%	0%	0%	0%
	Alfalfa (<i>Medicago sativa</i>)	0%	0%	0%	0%	1%	0%	0%
Annual Forbs	Tall tumblemustard (<i>Sisymbrium altissimum</i>)	0%	0%	2%	0%	0%	1%	0%
	Curvseed butterwort (<i>Ceratocephala testiculata</i>)	1%	0%	0%	0%	0%	0%	0%
	Clasping pepperweed (<i>Lepidium perfoliatum</i>)	0%	0%	0%	0%	0%	1%	0%
Shrubs	Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	0%	11%	0%	8%	0%	1%	16%
	Basin big sagebrush (<i>Artemisia tridentata tridentata</i>)	0%	0%	0%	1%	0%	0%	2%
	Mountain big sagebrush (<i>Artemisia tridentata vaseyana</i>)	0%	3%	0%	4%	0%	0%	3%

Ground Cover	Species	2004 HBC-5	2004 HBC-6	2004 HBC-8*	2004 HBC-9**	2004 HBC-4	2004 HBC-1^	2004 HBC-2
		Northwest Pasture			Northeast Pasture	Southwest Pasture	Southeast Pasture	
	Yellow rabbitbrush (<i>Chrysothamnus viscidiflorus</i>)	0%	0%	0%	0%	0%	18%	0%
Vegetation Total		58%	50%	50%	50%	58%	53%	41%
Other Cover	Bare Ground	20%	25%	28%	20%	17%	15%	24%
	Biological soil crust	0%	3%	0%	6%	0%	0%	5%
	Litter in contact with soil	22%	19%	22%	18%	23%	26%	27%
	Litter Standing	0%	3%	0%	6%	1%	5%	3%
	Persistent Litter	0%	0%	0%	0%	0%	0%	0%
	Rock or Gravel	0%	0%	0%	0%	1%	1%	0%

*Site burned in the 2006 Sailor Cap Fire

^Site burned in the 2007 Murphy Complex Fire

**Site burned in the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire

Due to differences in sampling locations and methodology (e.g. number of transects per site and number of points per transect) among the 2004 production and cover data, the 2006 ESI data, and the 2012 and 2013 HAF 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.

The amount of litter deviated from the reference condition in some areas. However, litter is providing cover for site protection, replenishing nutrients, and does not appear to be negatively affecting ecological processes.

Northwest Pasture

IIRH Site NW (Loamy 8-12")

Site NW (Photo 14) is located in a native vegetation community where Thurber's needlegrass is the dominant grass species (20% cover) and Wyoming big sagebrush is the dominant shrub species (18.5% cover). Biological soil crusts comprise 2.5 percent of cover (Table 20) at the site. The site is of relatively flat topography and has not burned by wildfire in over 50 years. A soil stability test (Pellant et al., 2005) was completed at the site during IIRH and the soil stability value averaged 4.7, indicating adequate soil surface resistance to erosion.

The indicator for litter amount was rated a slight to moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

Cheatgrass comprised 2.5 percent of cover (Table 20) but was noted in the 2013 IIRH field notes to be found in trace amounts at the site. It was further noted that cheatgrass was found in some disturbed areas, mainly along the main road adjacent to the site. Therefore, the indicator for invasive plants was rated a slight to moderate departure from the reference condition.

All other indicators related to the Biotic Integrity attribute other than litter amount and invasive plants were rated none to slight. The Biotic Integrity attribute was rated as none to slight departure from the reference condition because the ID Team concluded that the amount of litter

or cheatgrass at the site was not enough to justify a lower rating. Cheatgrass was mostly found in a few disturbed areas and along a well-travelled road.

Photo 14: June 2013 overview of IIRH site NW



Northeast Pasture

IIRH Site NE (Loamy 8-12")

Site NE (Photo 15) is located in a native vegetation community that has burned twice in the past 50 years. The site burned in the 2006 Sailor Cap Fire and the 2007 Murphy Complex Fire. The fires nearly eliminated sagebrush from the site. Some sagebrush has established as a result of rehabilitation efforts. Sandberg bluegrass is the dominant species (30.0% cover) at the site. In addition, biological soil crusts comprise 4.0 percent of cover (Table 20).

The indicator for soil surface loss or degradation was rated at a slight to moderate departure from the reference condition due to some evidence of soil loss. Field notes indicate that some soil loss appeared to have occurred following the 2006 and 2007 wildfires as evidenced through some slight pedestalling. It was also noted that soil loss did not appear to be active.

The 2013 IIRH field notes indicate that the amount of deep-rooted perennial bunchgrasses (Thurber's needlegrass) was reduced at the site. It was also noted that cheatgrass appeared to be increasing. Although it was noted that shrubs were increasing at the site, the functional/structural group indicator was rated at a moderate departure from the reference condition because the relative dominance of deep-rooted perennial bunchgrass was reduced and invasive annuals appeared to be increasing.

The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (40% cover for all layers) found at the site.

Photo 15: July 2013 overview of IIRH site NE



Cheatgrass comprised 4 percent of cover (Table 20) and was noted in the 2013 IIRH field notes to be common throughout the site. It was further noted that cheatgrass was dominant in some areas but was of low abundance or non-existent in other areas. Therefore, the indicator for invasive plants was rated as a moderate to extreme departure from the reference condition.

All other indicators related to the Biotic Integrity attribute were rated none to slight. The Biotic Integrity attribute was rated a moderate departure from the reference condition due to the lack of deep-rooted perennial grasses and dominance of cheatgrass in some areas that appears to be increasing.

Southwest Pasture

IIRH Site SW (Loamy 8-12")

At the time of the IIRH field evaluation, site SW (Photo 16) was located in a native vegetation community where Sandberg bluegrass was the dominant grass species (20.5% cover) and Wyoming big sagebrush was the dominant shrub species (27.0% cover). Biological soil crusts comprised 10.5 percent of cover (Table 20). However, the site burned in the 2013 Horse Butte 2 Fire and was subsequently drill seeded with a native-like seed mix. Because the site burned after the IIRH field evaluation, and because it was seeded with a native-like seed mix, the pasture is assessed for pre-fire conditions as a native plant community.

Photo 16: June 2013 overview of IIRH site SW



The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

Cheatgrass comprised 7.5 percent of cover (Table 20) but was noted in the 2013 IIRH field notes to be limited to disturbed areas within the site. Therefore, the indicator for invasive plants was rated a slight to moderate departure from the reference condition.

All other indicators related to the Biotic Integrity attribute were rated none to slight. Therefore, the Biotic Integrity attribute was rated none to slight departure from the reference condition.

Southeast Pasture

IIRH Site SE (Loamy 8-12")

Site SE (Photo 17) is located in a native vegetation community that has burned twice in the past 50 years; the 1973 Horse Butte Fire and the 2007 Murphy Complex Fire. The fires essentially removed sagebrush and other shrubs from the site. Sandberg bluegrass is the dominant species (31.5% cover) at the site. In addition, biological soil crusts comprise 3.5 percent of cover (Table 20).

The indicator for litter amount was rated a moderate departure from the reference condition due to an increased amount of litter (30.0% cover for all layers) found at the site.

Photo 17: July 2013 overview of IIRH site SE



Cheatgrass comprised 1 percent of cover (Table 20) but was noted in the 2013 IIRH field notes to be scattered throughout the site. It was further noted that cheatgrass was primarily found in or around disturbed areas. Therefore, the indicator for invasive plants was rated a moderate departure from the reference condition.

All other indicators related to the Biotic Integrity attribute were rated none to slight. The Biotic Integrity attribute was rated slight to moderate departure from the reference condition due to cheatgrass being scattered at the site.

Allotment Summary for Standard 4 (Native Plant Communities):

The Biotic Integrity attribute was none to slight at sites NW and SW, slight to moderate at site SE, and moderate at site NE.

The indicator for soil surface loss or degradation was rated at a slight to moderate departure from the reference condition at site NE and none to slight at the remaining three sites (NW, SW, and SE).

The functional/structural group indicator was rated moderate at site NE because the relative dominance of deep-rooted perennial bunchgrass was reduced and because invasive annuals appeared to be increasing. The functional/structural group indicator was rated none to slight departure from reference condition at the other three sites (NW, SW, and SE).

The litter amount indicator was rated slight to moderate departure at site NW and moderate at sites NE, SW, and SE. 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 sites NW and SW, moderate at site SE, and moderate to extreme at site NE. Cheatgrass ranged from trace amounts within disturbed areas at some sites to being common throughout other sites.

Evaluation of Standard 4

Northwest and Southwest Pastures

The 2013 IIRH field notes indicate there is a diverse presence of perennial forb species in the Northwest and Southwest Pastures. Eighteen forb species were noted in the Northwest Pasture and 12 were noted in the Southwest Pasture. The native plant communities in these pastures have sufficient plant cover to provide soil protection and resistance to erosion, as documented in the 2004 cover data, the 2006 ESI data, and the 2012 and 2013 HAF data (Tables 20 – 22).

Cheatgrass was limited to disturbed areas in most of the native plant communities; however, it was noted to be common at one upland trend site in the Southwest Pasture. Ground cover from perennial grasses, forbs, and biological soil crusts are expected to prevent substantial increases of cheatgrass throughout these pastures. Rush skeletonweed located in the Northwest Pasture was treated in 2005.

Portions of the Southwest Pasture burned in the 2012 Horse Butte and 2013 Horse Butte 2 Wildfires. Monitoring data and field notes collected in the spring of 2014 showed good establishment of seeded species. In addition, cover values for Sandberg bluegrass, squirreltail, western wheatgrass, and native forbs indicate that plants present prior to the fires are recovering. Scattered sagebrush seedlings were also observed.

Livestock utilization measured in both the Northwest and Southwest Pastures has averaged less than 20 percent. Both pastures were rested or spring deferred in 2012 through 2014. Spring grazing was also deferred in the Southwest Pasture in 2010 and 2011.

Upland trend data within the Northwest pasture show that over time bare ground has decreased while litter has increased. Meanwhile, percent cover of live vegetation has decreased in one area of the pasture but has increased in another area. Moreover, biological soil crusts have also increased over time within the pasture. Occurrences of key species (Thurber's needlegrass and Sandberg bluegrass) have increased within the pasture while cheatgrass has increased at one site and remained static at the other. Forbs have increased at both sites (Tables 9 and 10).

Upland trend data within the Southwest Pasture show that over time bare ground has decreased while litter has remained static. Meanwhile, percent cover of live vegetation has increased over time within the pasture. Moreover, biological soil crusts were not originally recorded within the pasture but are shown to comprise a substantial amount of cover in the most recent data. Occurrences of key species (Thurber's needlegrass and Sandberg bluegrass) have increased within the pasture; however, the upland trend sites have burned since data was collected and the effect of fire on Thurber's needlegrass within these areas is not known at this time. Cheatgrass has increased at both trend sites within the pasture. Forbs have also increase at both sites (Tables 13 and 14).

Evaluation Finding – Northwest and Southwest Pastures are:

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

Rationale for Evaluation Finding

Areas sampled in the Northwest (Photo 18) and Southwest Pastures contain an adequate abundance of deep-rooted perennial bunchgrass. Deep-rooted perennial bunchgrasses help support nutrient cycling and energy flow due to their above and below ground structure. Deep-rooted grasses generally have a long active growth period, large root system to stabilize soils and facilitate soil moisture percolation, and a high potential to capture and store carbon below ground.

Photo 18: June 2013 Overview of site NW within the Northwest Pasture



Plant cover, as well as some biological crusts (Tables 20 – 22), are providing adequate soil protection and competition to invasive species. The perennial species present within the pastures are appropriately productive and are capable of reproduction and recruitment of new seedlings. Although litter amounts are higher than expected, it is providing cover for site protection, replenishing nutrients, and does not appear to be negatively affecting ecological processes.

Cheatgrass comprises a low percentage of the cover (Tables 20 – 22) in the Northwest and Southwest Pastures. Cheatgrass was primarily limited to disturbed areas (rodent mounds, along roads, etc.) at the 2013 IIRH sites. It was also noted that cheatgrass was more prevalent near the main graveled roads. Rush skeletonweed is shown to have occurred in the northwest corner of the Northwest Pasture in areas that were chemically treated in 2005. Although cheatgrass and rush skeletonweed can become a threat to biotic integrity following large scale disturbances such as wildfire, these species are present at low densities and adequate desirable perennial species

and biological soil crusts are present within the native plant communities to hinder further spread or establishment of invasive or noxious plant species.

A substantial portion of the Southwest Pasture is lacking shrubs due to recent wildfires in 2012 and 2013. Shrubs were essentially removed from the burned areas, which would be expected following wildfire. Both fires were subsequently seeded with a native-like seed mix, including Wyoming big sagebrush. Because the Southwest Pasture was in good condition with an upward trend prior to the fires, and assuming rehabilitation efforts are successful, the pasture is expected to recover. Furthermore, ESR monitoring data collected in 2014 indicates recovery is occurring.

Overall, upland trend data within the Northwest and Southwest Pastures show that bare ground has decreased over time while litter cover has increased or remained static (Tables 9, 10, 13, and 14). Cover of live vegetation has increased in most areas, but has decreased at one of the four upland trend sites within the pastures. Biological soil crusts are shown to comprise a significant amount of cover within most areas of the pastures. Occurrences of key species (Thurber's needlegrass and Sandberg bluegrass), as well as forbs, have increased within both pastures. Cheatgrass has generally increased within the pastures but has remained static in some areas.

The native vegetation communities within the Northwest and Southwest Pastures have sufficient vegetation structure to resist the loss of biotic integrity and to recover following disturbances. Furthermore, the native vegetation communities are functioning to provide for the continued maintenance or improvement of native animal habitat, native plant populations, and ecological processes (nutrient cycling, hydrologic cycling, and energy flow).

Northeast and Southeast Pastures

Some evidence of past soil surface loss was noted in the Northeast Pasture at the IIRH site. Soil movement appeared to have occurred in the area following repeated wildfires in 2006 and 2007. However, there is no evidence of recent soil movement in either pasture. Adequate ground cover is present to protect the soil from accelerated erosion.

Wildfires removed most of the shrubs at both sites. Since the fires, rabbitbrush and Wyoming big sagebrush have begun to reestablish in the burned area. Large statured, deep rooted bunchgrasses were noted as lacking at the IIRH site in the Northeast Pasture and noted as being present at the IIRH site in the Southeast Pasture. This presence resulted in a "none to slight" deviation rating at the IIRH site in the Southeast Pasture. However, cover data taken along four transects throughout the pasture indicates deep rooted bunchgrasses are lacking in most areas of the Southeast Pasture. Further, trend data shows that the frequency and percent cover of Thurber's needlegrass has declined in the Southeast Pasture.

Cheatgrass is present in both the Northeast and Southeast Pastures. Cheatgrass was primarily found within localized disturbed areas in the Southeast Pasture, but was also noted to be scattered throughout some areas. Cheatgrass was common throughout some areas of the Northeast Pasture and dominant in others; however, it was also noted to be of low abundance or non-existent in other areas of the pasture. Rush skeletonweed was also noted as present in both pastures.

Prior to 1998, actual grazing use in the allotment averaged 3,334 AUMs. Since 1998, actual grazing use averaged 1,596 AUMs. Utilization levels measured since 2005 in both pastures have been less than 20 percent except for one year in the Southeast Pasture when use was measured at 31 percent on Thurber's needlegrass. The Northeast Pasture was rested from 2006 to 2008, spring deferred in 2010, and then rested again in 2014. The Southeast Pasture was rested in 2005 and 2009, spring deferred in 2010 and 2013, and then rested again in 2014.

Upland trend data within the Northeast Pasture shows that over time, bare ground, litter, and vegetative cover have remained static. Moreover, biological soil crusts were not originally recorded within the pasture but are shown to be present in the most recent data. Occurrences of key species (western wheatgrass and Sandberg bluegrass) at the site analyzed have remained static while cheatgrass has increased. Forbs have also increased at the site (Tables 11 and 12).

Upland trend data within the Southeast Pasture shows that over time, bare ground and litter cover has decreased. Meanwhile, cover of live vegetation has increased within the pasture. Moreover, biological soil crusts were not originally recorded within the pasture but are shown in the most recent data to occur at the site. Occurrences of key species (Thurber's needlegrass and western wheatgrass) have decreased within the pasture. Cheatgrass was not recorded at the site in 1989 or 2012. Forbs have increase at the site (Table 15).

Evaluation Finding – Northeast and Southeast Pastures 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 Northeast (Photo 19) and Southeast Pastures are not the dominant functional/structural group, as described in the ESD reference state. Rather, the native plant communities are dominated by Sandberg bluegrass. 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 grasses generally have a shorter active growth period, smaller root systems for stabilizing soils and facilitating soil moisture percolation, and relatively lower potential to capture and store carbon below ground. Shrubs are increasing within the pasture after they were removed by wildfires in 2006 and 2007, although they are currently at low densities (Photo 13).

Photo 19: July 2013 overview of site NE within the Northeast Pasture



Cheatgrass comprises 0-10 percent of cover (Tables 20 – 22) at the sites monitored in the Northeast and Southeast Pastures. Cheatgrass was found within disturbed areas in the Southeast Pasture, but was also noted to be scattered throughout some areas. Cheatgrass was common throughout some areas of the Northeast Pasture and dominant in others. Rush skeletonweed was also present within both pastures. Invasive species such as cheatgrass and rush skeletonweed can become a threat to biotic integrity and can influence ecological processes.

Overall, upland trend data within the Northeast and Southeast pastures show that bare ground and litter cover have decreased or remained static over time (Tables 11, 12, and 15). Cover of live vegetation has increased or remained static. The most recent trend data shows biological soil crusts to be present within the pastures. Wildfires have decreased the frequency of key species within burned areas, and occurrences of key species have decreased or remained static within the pastures. Cheatgrass was not recorded at the upland trend site in the Southeast Pasture during the most recent reading; however, cheatgrass has increased considerably at the sites in the Northeast Pasture. Sagebrush is reestablishing in some of the areas burned by wildfire but is still absent from other areas.

The native plant communities of the Northeast and Southeast Pastures are not functioning to maintain or promote native animal habitat for sagebrush dependent species or native plant populations. Due to the higher amount of cheatgrass, as well as the reduced relative dominance of deep-rooted perennial bunchgrasses, the diversity of native species has not been maintained or improved within the pasture.

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 portion of the Horse Butte AMP Allotment has been seeded with perennial non-native grass species (Crested wheatgrass), the JFO Interdisciplinary 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 Horse Butte AMP Allotment are dominated by native and seeded non-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.

Northwest, Northeast, and Southwest Pastures:

X Standard Doesn't Apply

The Idaho Department of Environmental Quality (IDEQ) has not completed water quality assessments within the Northwest, Northeast, or Southwest Pastures of the Horse Butte 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 the Northwest, Northeast, or Southwest Pastures.

Southeast Pasture:

Rangeland Health Assessment

All streams within the Southeast Pasture of the Horse Butte 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 Southeast Pasture. Due to the absence of surface water, aquatic life is not present within the pasture.

Evaluation of Standard 7

The USGS NHD identifies the perennial, intermittent, and ephemeral stream segments or reaches that make up the nation's surface water drainage systems (i.e., watersheds) and can be found at: <http://nhd.usgs.gov/index.html>. The NHD for the JFO is at a scale of 1:24,000/1:12,000 which is more detailed than the 1:100,000-scale NHD layer used by IDEQ. The miles of perennial, intermittent, and ephemeral stream used for the analysis were based on the 1:24,000/1:12,000 scale. The 2012 Integrated Report states the current multi-metric biological indices developed for

perennial streams and cannot be appropriately applied to intermittent (dewatered or ephemeral) streams until a specific protocol for monitoring or assessing intermittent (dewatered or ephemeral) waters is developed (IDEQ 2014; Section 3.2.4.1). Therefore, the water quality analysis focused on the non-ephemeral streams within the allotment.

The Southeast pasture includes 2.2 miles of Sailor Creek that occur within IDEQ Assessment Unit (AU) ID17050101SW006_02 (IDEQ, 2014). The AU identifies Sailor Creek as a Category 5 stream that is not meeting its designated beneficial uses due to impaired water quality (IDEQ, 2014). The designated beneficial use for Sailor Creek is cold water aquatic life and the cause for the impairment is sedimentation/siltation. Cold water aquatic life is the beneficial use IDEQ identifies for undesignated water bodies and waters with incomplete use designations (IDAPA 58.01.02). In 2010 and 2011, IDEQ collected measurements of bank stability within the AU. The bank stability measurements indicated bank stability within the AU was 100 percent which is well above IDEQ's threshold for 80 percent bank stability (Attachment E in the IDEQ 2014 report). However, the Environmental Protection Agency (EPA) did not approve the delisting based on streambank stability data (Attachment E in the IDEQ 2014 report). As a result, IDEQ retained Sailor Creek as a Category 5 stream until additional data could be collected to support the delisting.

Evaluation Finding – Southeast Pasture is:

- 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 in the Southeast Pasture based on IDEQ beneficial use support status and water quality impairment information for Sailor Creek (IDEQ, 2014). The reach of Sailor Creek within the allotment is not meeting its designated beneficial use of cold water aquatic life due to sedimentation/siltation (IDEQ 2014). However, the streams within the allotment are ephemeral and do not contain sufficient flows to support the designated beneficial use of cold water aquatic life.

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 Horse Butte AMP Allotment. In the JFO, 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 Horse Butte AMP Allotment based on SSURGO soil data (USDA and NRCS, 2012). Potential habitat occurs for one sensitive plant species, slickspot peppergrass (*Lepidium papilliferum*; Proposed Endangered, BLM sensitive species). Approximately 4,903 acres in the allotment 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

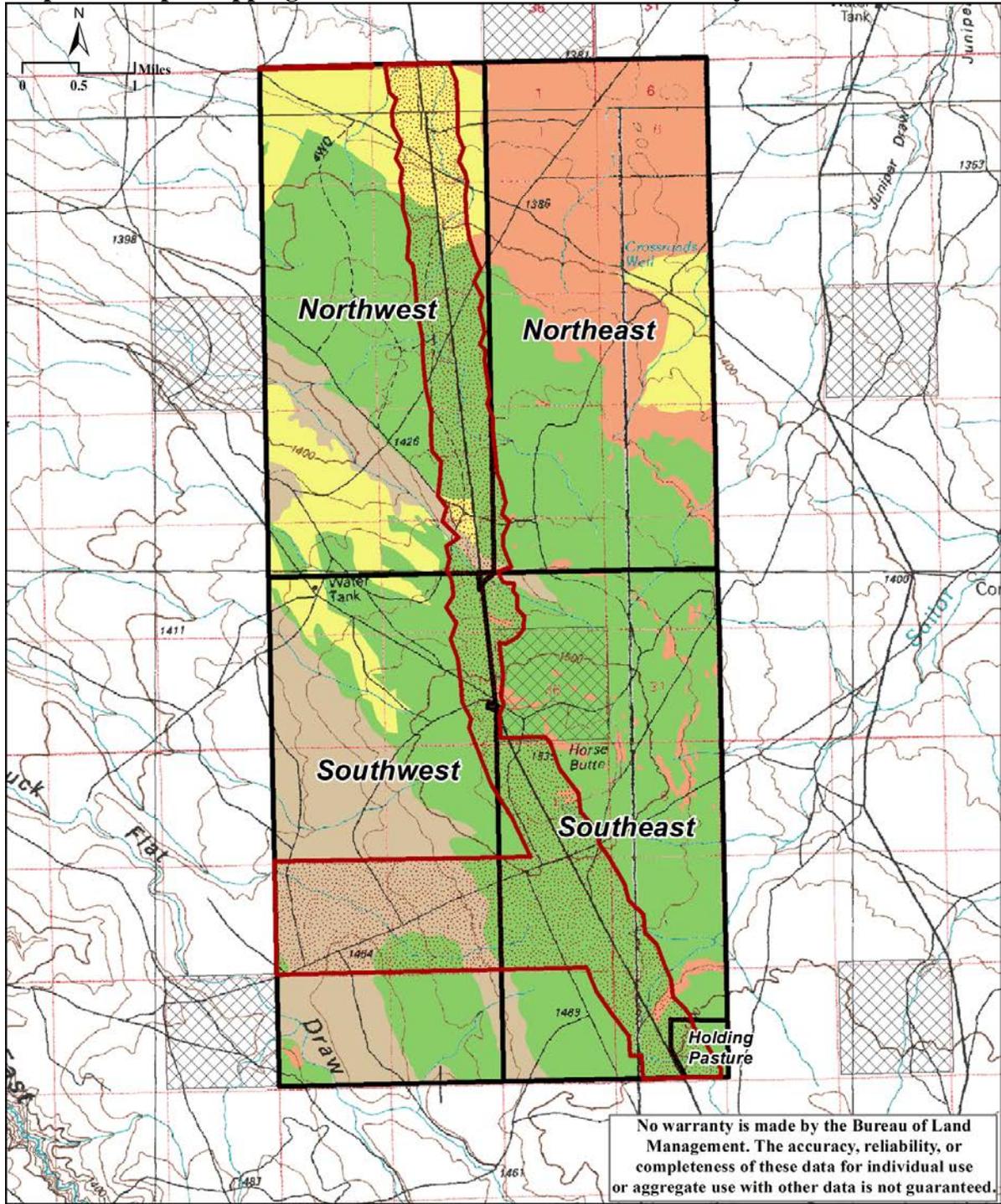
been conducted in the allotment. No special status plant species have been recorded during other monitoring efforts (e.g., slickspot peppergrass inventories, IIRH field visits, sage-grouse habitat assessments, fire rehabilitation monitoring, etc.).

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 Horse Butte AMP Allotment contains 18,652 acres (83% of allotment) of potential 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, and low) that identify the potential for finding the species. The allotment contains 12,194 acres of high potential, 3,510 acres of medium potential, 2,943 acres of low potential, and 3,829 acres of non-habitat for slickspot peppergrass (Table 23). The nearest known occupied habitat for slickspot peppergrass is 3 miles to the west, on the west side of Clover Creek.

Table 23: Slickspot peppergrass potential habitat (BLM managed acres)

Pasture	High	Medium	Low	Non-habitat
Northeast	2,009	3,246	487	11
Northwest	3,025	47	2,133	597
Southeast	4,795	202	0	178
Southwest	2,365	15	323	3,043

Map 8: Slickspot Peppergrass Potential Habitat and Area 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 Horse Butte AMP Allotment are discussed below.

There are no BLM sensitive or federally listed fish or aquatic invertebrates or their habitat within the allotment. No perennial streams 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. 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 predators (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 and slowly move 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).

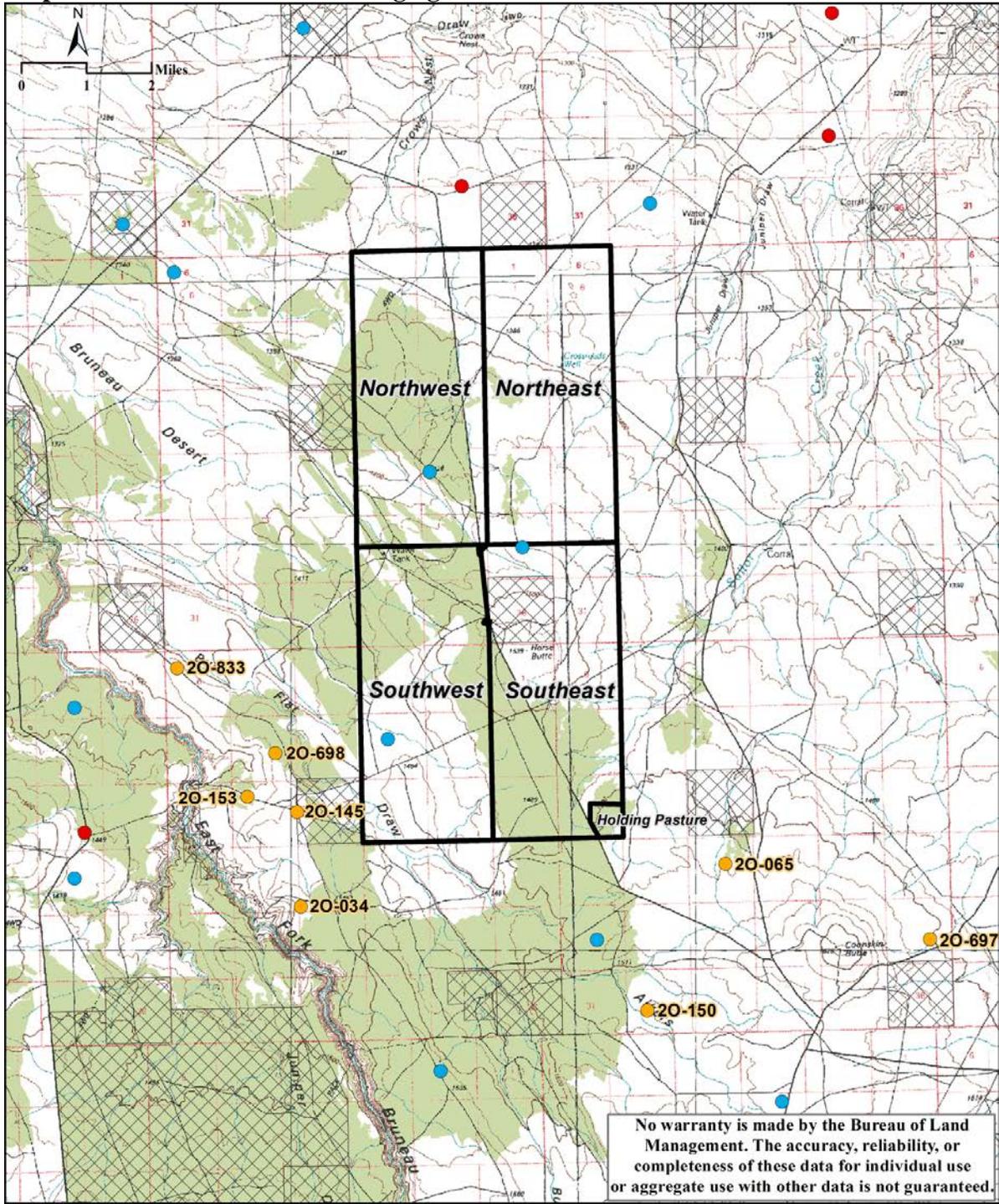
Based on vegetation mapping from 2013, the Horse Butte AMP Allotment contains 7,691 acres mapped as sagebrush (34% of the allotment, Map 9). Sagebrush occurs in the following pastures: Northeast (174 acres, 3% of pasture), Northwest (2,923 acres, 50% of pasture), Southeast (2,402 acres, 46% of pasture), and Southwest (2,190 acres, 38% of pasture).

The Tuana Fire of 1995, the Sailor Cap Fire of 2006, the Murphy Complex Fire of 2007, and the Horse Butte Fires of 2012 and 2013 have all reduced the amount of sagebrush in the allotment. Following the Sailor Cap Fire of 2006 and the Murphy Complex Fires of 2007, the BLM aerial seeded sagebrush in strips. In addition, following the Horse Butte Fires of 2012 and 2013 the BLM hand planted sagebrush seedlings and aerial seeded 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. Recovery is expected to occur sooner where sagebrush seedlings have been hand planted.

Sage-grouse have been observed in the adjoining allotment year round. Sage-grouse habitat extends from the Horse Butte AMP Allotment into the Buck Flat Allotment to the south and Juniper Ranch Allotment to the south and west (Map 9).

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Map 9: Shrubland Habitat and Sage-grouse Leaks



 Horse Butte Allotment & Pastures	 Shrubland	Management Status
 Non-BLM Land		 Occupied
		 Undetermined
		 Unoccupied

The Horse Butte AMP Allotment contains 3 undetermined (due to a lack of recent surveys) sage-grouse leks. Within five miles of the allotment there are 8 occupied, 12 undetermined, and 4 unoccupied sage-grouse leks (Map 9). Sage-grouse attendance at occupied leks within 5 miles of the allotment are shown in Table 24. Leks are considered occupied if there has been documented sage-grouse activity within the past five years.

Table 24: Sage-grouse attendance at occupied leks within 5 miles of the Horse Butte AMP Allotment, 2000-2014

Lek	Location	Survey Year ¹														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
2O-145	1.0 mile W	22	21	6	--	24	32	10	33	25	19	22	0	22	19	33
2O-698	1.3 mile W								7	--	--	3	0	0	--	--
2O-034	1.4 mile W						1	--	8	--	--	3	--	0	--	--
2O-065	1.6 mile SE										12	5	--	--	--	--
2O-153	1.8 mile W										3	12	--	--	0	0
2O-150	2.7 miles S						19	--	7*	15	7	6	0	--	--	--
2O-833	2.8 miles W												9	--	*	19
2O-697	5.0 miles SE								2*	0	0	4	1	4	0	0

¹Where 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 HAF (Stiver et al., 2010). Sage-grouse habitat suitability assessments were conducted in 2012 at HAF site **NE_1**- Northeast Pasture, HAF sites **NW_1** and **NW_2**- Northwest Pasture, HAF sites **SE** and **SE_1**- Southeast Pasture, and HAF site **SW**- Southwest Pasture. An assessment was also conducted in 2013 at HAF site **NW_3**- Northwest Pasture. Locations of HAF sites are shown in Map 7.

A sage-grouse chick was observed during the habitat suitability assessment in the Northeast Pasture. Sage-grouse droppings were observed during the habitat suitability assessments at HAF sites NE, NW_1, NW_2, and SW; however, no sign was observed at the other sites during the assessments. Sage-grouse droppings were observed during the IIRH field visits in the Northeast, Northwest, and Southwest 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 25.

Table 25: Sage-grouse habitat assessment worksheet for nesting and early brood-rearing habitat (arid site)

Habitat Indicator	Suitable Habitat	Marginal Habitat	Unsuitable Habitat
Average Sagebrush Canopy Cover	15 – 25%	10 - < 15% or > 25%	< 10%
	NW_1(18.5%)	SE_1(29%)	NE_1(8.5%), NW_2(0%), NW_3(0%), SE(0%), SW(0%)
Average Sagebrush Height	12 - 30"	10 -11" or >30"	< 10"
	NE_1(22"), SE_1(26")	NW_1(32")	NW_2(0"), NW_3(0"), SE(0"), SW(0")
Sagebrush Growth Form	Spreading	Mix of spreading and columnar	Columnar
		NE_1, NW_1, SE_1	NW_2, NW_3, SE, SW
Average Grass Height	≥ 7"	5 - < 7"	< 5"
	NW_2(7")	NE_1(5.3"), NW_1(5.6"), NW_3(6.5"), SE(5.4")	SE_1(4.4"), SW(4.8")
Average Perennial Grass Canopy Cover	≥ 10%	5 - < 10%	< 5%
	NE_1(42%), NW_1(50%), NW_2(57.5%), NW_3(96%), SE(66%), SE_1(33%), SW(43%)		
Average Forb Canopy Cover	≥ 5%	3 - < 5%	< 3%
	NE_1(6.5%), SE(14%), SE_1(5%)	NW_3(3%)	NW_1(2.5%), NW_2(1%), SW(1%)
Preferred Forb Abundance and Diversity	Forbs common with at least a few preferred species common	Forbs common, but only 1 or 2 preferred species present	Forbs rare to sparsely present
	NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW		
Overall Site Evaluation	NW_1	NE_1, SE_1	NW_2, NW_3, SE, SW
Pasture Evaluation	Northwest	Southwest, Southeast	Northeast

The Northeast Pasture contained one HAF site. HAF site NE_1 is located in an area mapped as a Sandberg bluegrass vegetation community. Attributes at HAF site NE_1 were rated suitable for sagebrush height, perennial grass canopy cover, forb canopy cover, and preferred forb abundance and diversity. Shrub growth form and grass height were rated marginal and sagebrush canopy cover was rated unsuitable. Sagebrush was measured at 8 percent cover and sagebrush seedlings were observed. Eighteen species of forbs were observed and they occurred at moderate density (2.62 forbs per 0.1 m² plot). The most common forbs were longleaf phlox (*Phlox longifolia*), sagebrush phlox (*Phlox aculeata*), and lupine (*Lupinus* spp.). Cheatgrass was measured at 12.5 percent of cover (cover values reported are for all layers). Over time, increases of cheatgrass can limit native perennial and annual forbs and increase fine fuels making wildfires more likely. While wildfires have reduced shrub cover throughout the pasture, the 2013 satellite imagery shows extensive areas of scattered patches of sagebrush and rabbitbrush. These patches are

predominately in the southern half of the pasture. Many of these patches do not appear on the vegetation map because the patch size does not meet the minimum mapping unit of ≥ 20 acres, or the patch does not contain ≥ 10 percent shrub cover. While patches of sagebrush and rabbitbrush may provide some habitat for nesting, the majority of the pasture does not contain a sufficient density of shrubs for nesting. Overall, the Northeast Pasture was rated unsuitable for sage-grouse nesting and early brood rearing.

The Northwest Pasture contained three HAF sites. HAF site NW_1 is located in an area mapped as a Wyoming sagebrush/ Thurber's needlegrass vegetation community. HAF site NW_2 is located in an area mapped as a Sandberg bluegrass vegetation community. HAF site NW_3 is located in an area mapped as a crested wheatgrass vegetation community. Attributes at HAF site NW_1 were rated suitable for sagebrush canopy cover, perennial grass canopy cover, and preferred forb abundance and diversity. All other habitat indicators were rated marginal except for average forb canopy cover which was rated unsuitable. Although average forb canopy cover was unsuitable, the site was rated suitable for preferred forb abundance and diversity with 14 species of forbs observed. Forbs were observed at high density (3.56 forbs per 0.1 m² plot). The most common species included sagebrush phlox, longleaf phlox, and spiny phlox (*Phlox hoodia*), which are all sage-grouse preferred forbs. Cheatgrass was recorded at 2 percent of cover (all layers). Attributes at HAF site NW_2 were rated suitable for grass height, perennial grass canopy cover, and preferred forb abundance and diversity. Sagebrush was absent at the site and forb canopy cover was only 1 percent. Although forb canopy cover was rated unsuitable, HAF site NW_2 contained 14 species of forbs. Forbs occurred at moderate density (2.16 forbs per 0.1 m² plot). The most common forbs were sagebrush phlox and longleaf phlox. Cheatgrass was observed at 1 percent of cover (all layers). Attributes at HAF site NW_3 were rated unsuitable for sagebrush attributes, marginal for grass height and forb canopy cover, and suitable for perennial grass canopy cover and preferred forb abundance and diversity. Eight species of forbs were observed and they occurred at high density (3.18 forbs per 0.1 m² plot). The most common forbs were also sagebrush phlox and longleaf phlox. Cheatgrass was recorded at 2 percent of cover (all layers). The Northwest Pasture contains extensive areas of suitable sage-grouse habitat. Sagebrush in the Northwest Pasture is part of a large contiguous area of sagebrush that extends to the south into the Southwest Pasture of this allotment and to the west into Pasture 5 and 6 of the Juniper Ranch Allotment. In the southern portion of the pasture mapped as a crested wheatgrass community, sagebrush is present in patches. Overall, the Northwest Pasture is suitable for sage-grouse during nesting and early brood rearing.

The Southeast Pasture contained two HAF sites. HAF site SE is located in the central portion of the pasture in an area mapped as a Sandberg bluegrass vegetation community. HAF site SE_1 is located in the southern portion of the pasture in an area mapped as a Wyoming sagebrush/ Sandberg bluegrass vegetation community. Attributes at HAF site SE were rated unsuitable for sagebrush indicators, marginal for grass height, and suitable for the remaining habitat indicators. Yellow rabbitbrush was recorded at 5 percent cover along the transects. Thirteen species of forbs were observed and they occurred at high density (6.12 forbs per 0.1 m² plot). The most common forbs were sagebrush phlox, lupine, longleaf phlox, shaggy fleabane (*Erigeron pumilus*), mourning milkvetch, and spiny phlox. Cheatgrass was recorded at 2.5 percent of cover (all layers). Attributes at HAF site SE_1 were rated suitable for sagebrush height, perennial grass canopy cover, forb canopy cover, and preferred forb abundance and diversity. Sagebrush canopy

cover and sagebrush growth form were rated marginal and grass height was rated unsuitable. Thirteen species of forbs were observed and they occurred at moderate density (2.59 forbs per 0.1m² plot). The most common forbs were sagebrush phlox, longleaf phlox, cous biscuitroot (*Lomatium cous*), mourning milkvetch (*Astragalus atratus*), and pale agoseris (*Agoseris glauca*). Cheatgrass was recorded at 1 percent of cover (all layers). The southern half of the pasture is part of a large contiguous area of sagebrush that extends to the Southwest Pasture in this allotment and into Pasture 2 of the Buck Flat AMP Allotment. The southern half of the pasture provides habitat for nesting. The northern portion of the pasture has burned and sagebrush has been reseeded in the area. During the IIRH field visit sagebrush was only observed at trace levels. Yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and broom snakeweed (*Gutierrezia sarothrae*) are common throughout the northern portion of the pasture. These shrub species provide some cover for nesting. Overall, the Southeast Pasture was rated marginal for sage-grouse nesting and early brood rearing.

The Southwest Pasture contained one HAF site. HAF site SW is located in the south half of the pasture in an area that burned in the Horse Butte 2 Fire of 2013. The area is currently mapped as recent burn. Attributes at the site were rated suitable for perennial grass canopy cover and preferred forb abundance and diversity. The remaining attributes were all rated unsuitable. At the time of the survey in 2012, 10 species of forbs were recorded and they occurred at moderate density (1.8 forbs per 0.1 m² plot). Cheatgrass was recorded at 9.5 percent of cover (all layers). The site has not been assessed since the fire. Sagebrush has been aerially reseeded across the entire area that burned and sagebrush seedlings were also hand planted in patches. Until sagebrush achieves sufficient height and density for nesting the area that burned remains unsuitable for sage-grouse. The northern half of the pasture is part of a large contiguous area of sagebrush that extends to the Northwest and Southeast Pastures in this allotment and into Pastures 5 and 6 of the Juniper Ranch Allotment. The northern half of the pasture is suitable for nesting. Taking into account both suitable and unsuitable areas, the Southwest Pasture was rated marginal overall for nesting and early brood rearing.

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

Late Brood Rearing Habitat

A few unnamed drainages occur throughout the allotment. In some years areas along the drainages contain a higher abundance of preferred forbs than the surrounding uplands while in other years the drainages are dry. Drainages provide some limited brood rearing habitat for sage-grouse. Overall, the Northwest, Southeast, and Southwest Pastures contain marginal late brood rearing habitat. Drainages in the Northeast Pasture are generally not in areas that contain suitable sagebrush cover.

Winter Habitat

The Northwest Pasture contains shrub height and cover that is suitable for wintering sage-grouse across the majority of the pasture. Snow depths are usually less than 12 inches during the winter, leaving most sagebrush above the snow and available for wintering sage-grouse. The Southeast and Southwest Pastures also contains areas of suitable wintering habitat in areas mapped as sagebrush. The remaining areas in these pastures do not contain shrubs of sufficient height or

density for wintering use. Overall, the Southeast and Southwest Pastures are marginal as wintering habitat since they contain a mixture of both suitable and unsuitable areas.

The Northeast Pasture is unsuitable for wintering sage-grouse since sagebrush of adequate size and density is largely absent due to wildfire. Sagebrush islands provide some wintering habitat; however, these islands are somewhat isolated from other suitable areas.

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 nest selection, egg incubation, and young rearing, although 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 ferruginous hawk nests in the allotment. However, there are numerous nests outside of the allotment along Buck Flat Draw (1 mile to the west). Ferruginous hawks from these nesting territories likely hunt in the Horse Butte AMP Allotment. The Northwest, Southeast, and Southwest Pastures 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. The Northeast Pasture contains scattered patches of sagebrush and rabbitbrush which also provide suitable habitat for prey species hunted by ferruginous hawks.

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 (*Chrysothamnus viscidiflorus*) (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 and rabbitbrush habitats within the Horse Butte AMP Allotment. At this time shrub height and density are suitable for Brewer's sparrow nesting in the all pastures of the allotment. The Northwest, Southeast, and Southwest Pastures contain large areas of sagebrush which provide suitable habitat for nesting. The Northeast Pasture contains scattered patches of sagebrush and rabbitbrush which also provides suitable nesting habitat.

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 Horse Butte AMP Allotment. Nesting habitat for loggerhead shrikes is limited to areas containing taller sagebrush. While the allotment contains areas of scattered rabbitbrush, plants are generally too short for nesting. Sagebrush of suitable height for nesting occurs in all pastures of the allotment. The HAF site in the Northeast Pasture contained a few sagebrush along the transect in the 36-40" range. At HAF site NW_1 numerous sagebrush along the transect were in the 40-53" range and at HAF site SE_1 they were a few sagebrush in the 42-48" range. Heights of sagebrush in the northern portion of the Southwest Pasture are similar to those in the Southeast and Northwest Pastures.

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

Sagebrush sparrows are sagebrush obligates that are typically common in shrub-steppe habitats (Martin and Carlson, 1998). Sagebrush sparrows 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 of habitat to provide 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 areas containing sagebrush. At this time shrub height and density are suitable for Brewer's sparrow nesting in the all pastures of the allotment. The Northwest, Southeast, and Southwest Pastures contain large areas of sagebrush which provide suitable habitat for nesting. The Northeast Pasture contains scattered patches of sagebrush and rabbitbrush which also provides suitable nesting habitat.

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).

Pygmy rabbits are likely to be present in areas containing tall dense sagebrush cover within the Northwest, Southeast, and Southwest Pastures. The Northwest Pasture contains extensive areas of suitable habitat. The Southeast and Southwest Pastures contain a mixture of suitable and unsuitable areas. For this reason, the Southeast and Southwest Pastures were rated marginal for pygmy rabbits.

Dense sagebrush cover that is necessary for pygmy rabbits has been largely removed by wildfires in the Northeast Pasture. Prior to the Murphy Complex Fire of 2007, active burrows and pellets were observed in the Northeast Pasture during surveys in 2005 (60 acres surveyed). Surveys for pygmy rabbits have also been conducted in the Northwest Pasture (190 acres surveyed in 2006, no active burrows, no old burrows or tracks/pellets observed) and Southwest Pasture (225 acres surveyed in 2010, old burrows were observed, no active burrows or tracks/pellets observed). Pygmy rabbits have been observed in adjacent allotments including Coonskin AMP and Juniper Ranch.

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 the Northwest, Southeast, and Southwest Pastures are suitable to maintain a relatively stable Piute ground squirrel population (Steenhof et al., 2006). The Northeast Pasture contains scattered patches of sagebrush and rabbitbrush which also provide suitable habitat 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 within rock crevices in tall cliffs. Little is known about the behavior and population size of spotted bats.

Tall cliffs that would provide suitable roosting habitat for spotted bats are not present in the allotment. Potential roosting habitat lies along the cliffs associated with Clover Creek which is 2.4 miles to the west (outside the allotment). Spotted bats may forage over the allotment. Horse Butte Reservoir (0.5 acre in size) located between the Southeast and Southwest Pastures contains water that could be used by spotted bats. The reservoir receives water through a pipeline and generally contains water throughout the entire summer.

Evaluation of Standard 8

There are no known BLM Sensitive or Federally listed plants within the Horse Butte AMP Allotment. Approximately 4,903 acres in the allotment 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 12,194 acres of high potential, 3,510 acres of medium potential, 2,943 acres of low potential, and 3,829 acres of non-habitat for slickspot peppergrass (Table 23). The nearest known occupied habitat for slickspot peppergrass is 3 miles west, on the west side of Clover Creek.

There are no BLM sensitive or federally listed fish or aquatic invertebrates or their habitat within the allotment. No perennial streams occur within the allotment.

Habitat for BLM sensitive wildlife species occurs within the allotment. Overall habitat ratings for each species by pasture are shown in Table 26.

Table 26: Overall habitat suitability for BLM sensitive wildlife species by pasture

Species Name and Type of Habitat	Northeast	Northwest	Southeast	Southwest
Sage-grouse (nesting & early brood rearing)	U	S	M	M
(late brood rearing)	U	M	M	M
(winter)	U	S	M	M
Ferruginous hawk (nesting)	U	U	U	U
(foraging)	S	S	S	S
Brewer's sparrow (nesting)	S	S	S	S
Sagebrush sparrow (nesting)	S	S	S	S
Loggerhead shrike (nesting)	S	S	S	S
Pygmy rabbit (year round)	U	S	M	M
Piute ground squirrel (year round)	S	S	S	S
Spotted bat (roosting)	U	U	U	U
(foraging)	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 suitable in the Northwest Pasture, marginal in the Southeast and Southwest Pastures, and unsuitable in the Northeast Pasture. The Northwest Pasture contains extensive areas with favorable shrub height, shrub cover, shrub growth form, residual herbaceous height and cover, and forb abundance and diversity of sage-grouse preferred forbs. The Southeast and Southwest Pastures contain areas of intact sagebrush, which provides habitat for nesting, as well as areas that have burned. Sagebrush has been aerially reseeded across the entire area that burned, and sagebrush seedlings were also hand planted in patches. Until sagebrush achieves sufficient height and density for nesting, the burned areas will remain unsuitable for sage-grouse. The Northeast Pasture contains areas of scattered patches of sagebrush and rabbitbrush. While patches of sagebrush and rabbitbrush may provide some habitat for nesting, the majority of the Northeast Pasture does not contain shrubs of sufficient density for nesting. Drainages which occur throughout the allotment provide some late brood rearing habitat. Areas along the drainages contain a higher abundance of preferred forbs than the surrounding uplands in some years, while in other years the drainages are dry. The Northwest, Southeast, and Southwest Pastures were rated marginal for late brood rearing habitat. The Northeast Pasture was rated unsuitable since drainages in the pasture are generally far from suitable sagebrush cover. The Northwest Pasture was rated suitable as winter habitat, the Southeast and Southwest Pastures were rated marginal, and the Northeast Pasture was rated unsuitable.

Junipers that could be used for nesting by ferruginous hawks do not occur in 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 all pastures.

Shrub height and cover is suitable for Brewer's sparrow, loggerhead shrike, and sagebrush sparrow nesting in all pastures of the allotment. Dense sagebrush cover that is necessary for pygmy rabbits has been largely removed by wildfires in the Northeast Pasture. The Northwest Pasture contains extensive areas of tall dense sagebrush that provides suitable habitat for pygmy rabbits. The Southeast and Southwest Pastures also contain areas of tall dense sagebrush.

However, since these pastures also contain large areas without dense sagebrush they were rated marginal for pygmy rabbits.

All pastures in the allotment contain suitable habitat for Piute ground squirrels.

Spotted bat roosting habitat was rated unsuitable since the allotment does not contain cliffs for roosting. The allotment was rated suitable for spotted bat foraging due to its proximity to roosting habitat and the likelihood that bats forage over the allotment. Horse Butte Reservoir provides water to bats in the allotment.

Evaluation Finding – Northwest Pasture is:

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

Rationale for Evaluation Finding

The Northwest Pasture contains suitable habitat for the majority of special status species. Therefore, the pasture is meeting Standard 8. The Northwest Pasture contains extensive areas of suitable sage-grouse habitat. Sagebrush within the Northwest Pasture is part of a large contiguous area of sagebrush that extends to the south into the Southwest Pasture of this allotment and to the west into Pastures 5 and 6 of the Juniper Ranch Allotment. In the southern portion of the pasture mapped as a crested wheatgrass community, sagebrush is present in patches.

Evaluation Finding – Southeast and Southwest Pastures are:

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

Rationale for Evaluation Finding

The Southeast and Southwest Pastures contain marginal to suitable habitat for the majority of special status species. Therefore, these pastures are not meeting Standard 8, but are making significant progress towards meeting. The southern half of the Southeast Pasture and the northern half of the Southwest Pasture contain suitable nesting habitat for sage-grouse. The northern half of the Southeast Pasture burned in 2007 and the southern half of the Southwest Pasture burned in 2013. Sagebrush has been aerial seeded in both pastures. Sagebrush seedlings were also hand planted in the Southwest Pasture. Until sagebrush achieves sufficient height and density for nesting, the burned areas will remain unsuitable for sage-grouse.

Evaluation Finding – Northeast Pasture is:

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

Rationale for Evaluation Finding

The Northeast Pasture contains marginal to unsuitable habitat for the majority of special status species. Therefore, the pasture is not meeting Standard 8. Patches of rabbitbrush and sagebrush occur throughout the Northeast Pasture. However, many of these patches do not appear on the vegetation map because the patch size does not meet the minimum mapping unit of ≥ 20 acres or the patch does not contain ≥ 10 percent shrub cover. While patches of sagebrush and rabbitbrush may provide some habitat for sage-grouse nesting, following the 2006 and 2007 wildfires the majority of the pasture does not contain shrubs of sufficient density for nesting.

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APPENDIX A: 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.

APPENDIX B: SPECIES LIST ACCUMULATED DURING UPLAND ASSESSMENTS

Scientific Name	Common Name	Species Type	Site(s) where species occurred
Perennial Grasses			
<i>Achnatherum thurberianum</i>	Thurber's needlegrass	Native	NE, NE_1, NW_1, NW_2, NW_3, SE, SW
<i>Agropyron cristatum</i>	Crested wheatgrass	Exotic, Seeded	NE_1
<i>Elymus elymoides</i>	squirreltail		NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Elymus lanceolatus</i>	Thickspike wheatgrass	Native	NE, SE, SW
<i>Leymus cinereus</i>	Basin wildrye	Native	
<i>Pascopyrum smithii</i>	Western wheatgrass	Native	NE_1, NW_1, NW_2, SE, SE_1, SW
<i>Poa secunda</i>	Sandberg bluegrass	Native	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass	Native, Seeded	NE_1, NW_1, SE
Annual Grasses			
<i>Bromus tectorum</i>	Cheatgrass	Exotic, Invasive	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Vulpia microstachys</i>	Small fescue	Native	NE_1, SE, SW
<i>Vulpia octoflora</i>	Sixweeks fescue	Native	NW_3, SE
Perennial Forbs			
<i>Achillea millefolium</i>	Western yarrow	Native, Sage-grouse Preferred	NE_1
<i>Allium</i> spp.	Onion	Native	NE, NE_1, NW_3
<i>Allium nevadense</i>	Nevada onion	Native	NW_1
<i>Antennaria dimorpha</i>	Low pussytoes	Native, Sage-grouse Preferred	NE_1, NW_1, SE, SE_1, SW
<i>Astragalus atratus</i>	Mourning milkvetch	Native	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1
<i>Astragalus lentiginosus</i>	Freckled milkvetch	Native	NE, NE_1, NW_1, SE, SW
<i>Astragalus purshii</i>	Woollypod milkvetch	Native	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Castilleja angustifolia</i>	Northwestern Indian paintbrush	Native	NE_1, NW_1, SE, SE_1, SW
<i>Crepis</i> spp.	Hawksbeard	Native, Sage-grouse Preferred	NE_1, SE
<i>Crepis acuminata</i>	Tapertip hawksbeard	Native, Sage-grouse Preferred	NE_1, NW_1, NW_2, NW_3, SE, SW
<i>Crepis occidentalis</i>	Largeflower hawksbeard	Native, Sage-grouse Preferred	SE

Scientific Name	Common Name	Species Type	Site(s) where species occurred
<i>Delphinium andersonii</i>	Anderson's larkspur	Native	NE_1, NW_1, SE, SW
<i>Erigeron pumilus</i>	Shaggy fleabane	Native, Sage-grouse Preferred	NE, NE_1, NW_1, NW_2, SE, SW
<i>Ionactis alpina</i>	Lava aster	Native, Sage-grouse Preferred	NE_1, SE_1
<i>Linanthus pungens</i>	Granite prickly phlox	Native	SW
<i>Linum lewisii</i>	Lewis flax	Native	NE_1
<i>Lomatium cous</i>	Cous biscuitroot	Native, Sage-grouse Preferred	NW_2, SE_1
<i>Lomatium foeniculaceum</i>	Desert biscuitroot	Native, Sage-grouse Preferred	NW_1, NW_2, SE_1
<i>Lupinus</i> spp.	Lupine	Native	NE_1, SE
<i>Machaeranthera canescens</i>	Hoary tansyaster	Native	NE, NE_1, SE_1
<i>Medicago sativa</i>	Alfalfa	Exotic, Sage-grouse Preferred	NE_1
<i>Mertensia oblongifolia</i>	Oblongleaf bluebells	Native	SE
<i>Penstemon</i> spp.	Penstemon	Native	SE
<i>Penstemon procerus</i>	Littleflower penstemon	Native	NW_1, SE
<i>Phlox aculeata</i>	Sagebrush phlox	Native, Sage-grouse Preferred	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Phlox hoodii</i>	Spiny phlox	Native, Sage-grouse Preferred	NE_1, NW_1, NW_2, NW_3, SE, SW
<i>Phlox longifolia</i>	Longleaf phlox	Native, Sage-grouse Preferred	NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Senecio integerrimus</i>	Lambstongue ragwort	Native	SE
<i>Sphaeralcea munroana</i>	Munro's globemallow	Native	NE_1
<i>Tragopogon dubius</i>	Yellow salsify	Exotic, Sage-grouse Preferred	NE, NE_1, NW_2, SE
<i>Zigadenus venenosus</i>	Meadow deathcamas	Native	NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
Annual Forbs			
<i>Agoseris glauca</i>	Pale agoseris	Native, Sage-grouse Preferred	NE_1, NW_1, NW_2, SE, SE_1, SW
<i>Agoseris heterophylla</i>	Annual agoseris	Native, Sage-grouse Preferred	NE_1, SW, SE_2
<i>Alyssum desertorum</i>	Desert madwort	Exotic	NE_1, SE, SE_1
<i>Cerastium nutans</i>	Nodding chickweed	Native	NE_1, NW_1, SE, SE_1, SW
<i>Ceratocephala testiculata</i>	Curveseed butterwort	Exotic	NE_1, SE, SE_1, SW
<i>Collinsia parviflora</i>	Maiden blue eyed Mary	Native	NW_1, SE, SE_1, SW
<i>Descurainia pinnata</i>	Western tansymustard	Native	NE, NE_1, SE, SE_1
<i>Draba verna</i>	Spring draba	Exotic	NE_1, SE, SE_1, SW
<i>Epilobium brachycarpum</i>	Tall annual willowherb	Native, Sage-grouse Preferred	NE, NE_1, NW_1, NW_2, SE, SE_1, SW

Scientific Name	Common Name	Species Type	Site(s) where species occurred
<i>Erodium cicutarium</i>	Redstem stork's bill	Exotic	NE_1
<i>Gayophytum</i> spp.	Groundsmoke	Native	NE_1
<i>Gilia sinuata</i>	Rosy gilia	Native	SW
<i>Lactuca serriola</i>	Prickly lettuce	Exotic, Sage-grouse Preferred	NE, NE_1, NW_2, SE
<i>Lepidium perfoliatum</i>	Clasping pepperweed	Exotic	NE_1, SE, SE_1, SW
<i>Mertensia oblongifolia</i>	Oblongleaf bluebells	Native	SW
<i>Microsteris gracilis</i>	Slender phlox	Native, Sage-grouse Preferred	NE_1, NW_1, SE, SE_1
<i>Myosotis stricta</i>	Strict forget-me-not	Exotic	SE_1, SW
<i>Salsola kali</i>	Russian thistle	Exotic	NE
<i>Sisymbrium altissimum</i>	Tall tumbled mustard	Exotic	NE, NE_1, NW_1, NW_2, SE
<i>Townsendia florifer</i>	Showy townsend daisy	Native, Sage-grouse Preferred	SW
Noxious Weeds			
<i>Chondrilla juncea</i>	Rush skeletonweed	Exotic, Invasive	NE, SE
Shrubs			
<i>Artemisia tridentata</i> <i>ssp. wyomingensis</i>	Wyoming big sagebrush	Native	NE, NE_1, NW_1, NW_2, NW_3, SE, SE_1, SW
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	Native	NE_1, SE
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	Native	NE, NE_1, NW_1, SE
<i>Gutierrezia sarothrae</i>	Broom snakeweed	Native	SE

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