

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

RANGELAND HEALTH ASSESSMENT AND EVALUATION REPORT

**CAMAS SLOUGH ALLOTMENT #01095
GRASSY HILLS ALLOTMENT #01029**

December 3, 2015

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ALLOTMENT INFORMATION

Field Office: Jarbidge Field Office (JFO)

Name of Permittee: JRS Properties III LP (Cedar Creek Cattle Company)

Allotment Name/Number: Camas Slough (#01095) and Grassy Hills (#01029)

Date of Field Assessment: July 24, 2013

Stream Miles on Public Land:

Camas Slough: 0.4 miles (intermittent stream)

Grassy Hills: 0.0 miles (ephemeral streams only)

Table 1: Camas Slough and Grassy Hills Allotment Acres

Allotment	Total Acres	BLM Acres	State Acres	Private Acres	Other Acres
Camas Slough	1,603	1,603	0	0	0
Grassy Hills	4,908	4,908	0	0	0

Table 2: Assessment Participants

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

CURRENT PERMITTED LIVESTOCK GRAZING USE

Camas Slough Allotment:

Total Active Use: 252 AUMs

Livestock Type: Cattle

Livestock Numbers: 21 Cattle

Season of Use: 03/01 to 2/28

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

Current Stocking Level: 6.4 Acres/AUM

Grassy Hills Allotment:

Total Active Use: 852 AUMs

Livestock Type: Cattle

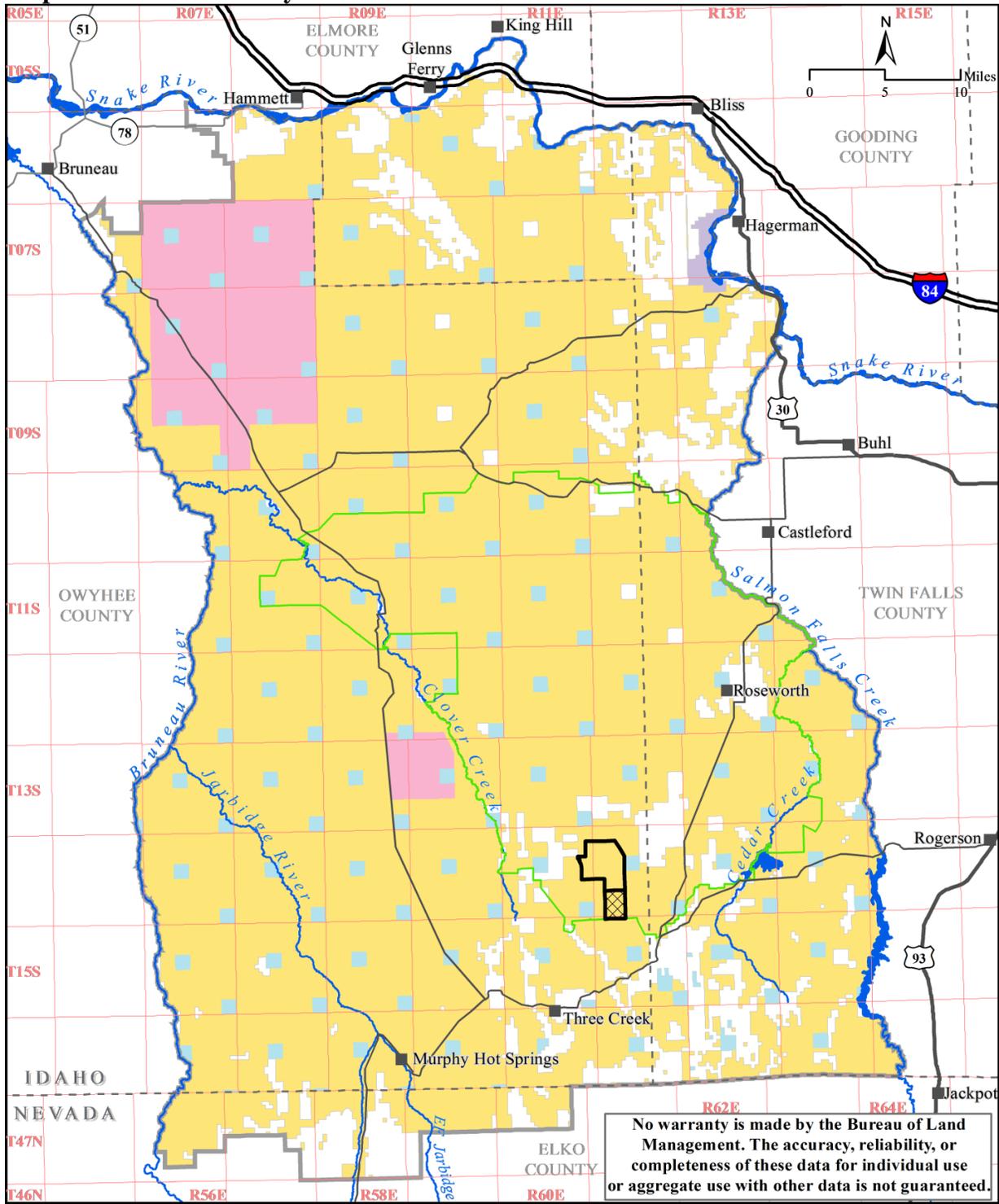
Livestock Numbers: 71 Cattle

Season of Use: 03/01 to 2/28

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

Current Stocking Level: 5.8 Acres/AUM

Map 1: Allotment Vicinity



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

ALLOTMENT PROFILE

The Camas Slough and Grassy Hills Allotments are located in the southeast part of the JFO approximately 10 miles northeast of Three Creek, Idaho (Map 1). The elevation ranges from approximately 5,860 feet on Grassy Hill to 5,660 feet at Camas Slough and to 5,460 feet in the northeast corner of the East Pasture of the Grassy Hills Allotment.

Climate

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

Weather data collected at the Horse Butte RAWS station is used to assess precipitation and temperature trends from 2004 to 2013. The RAWS station is located in an 8 to 12 inch precipitation zone 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

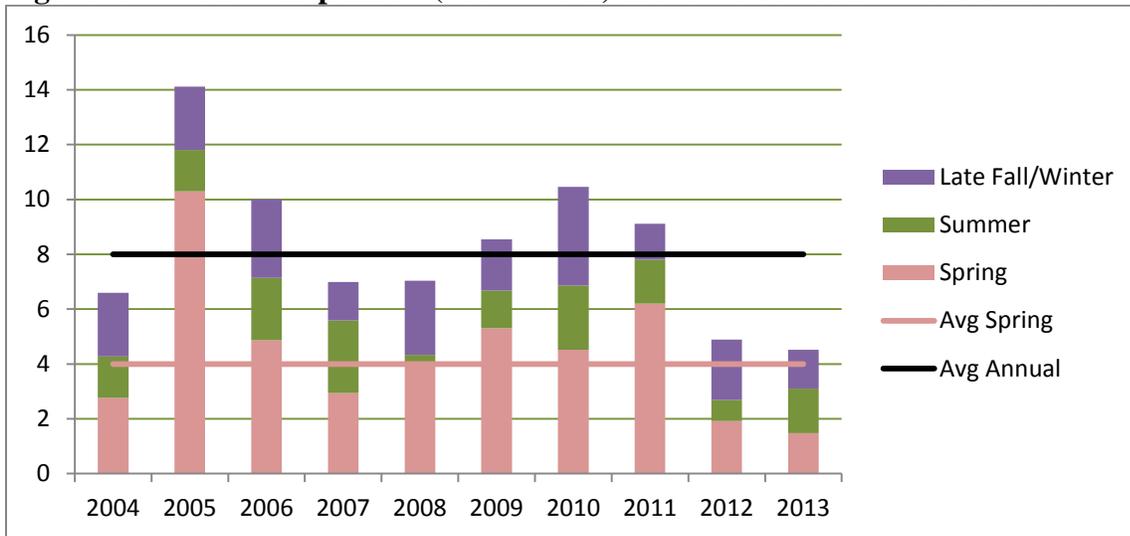
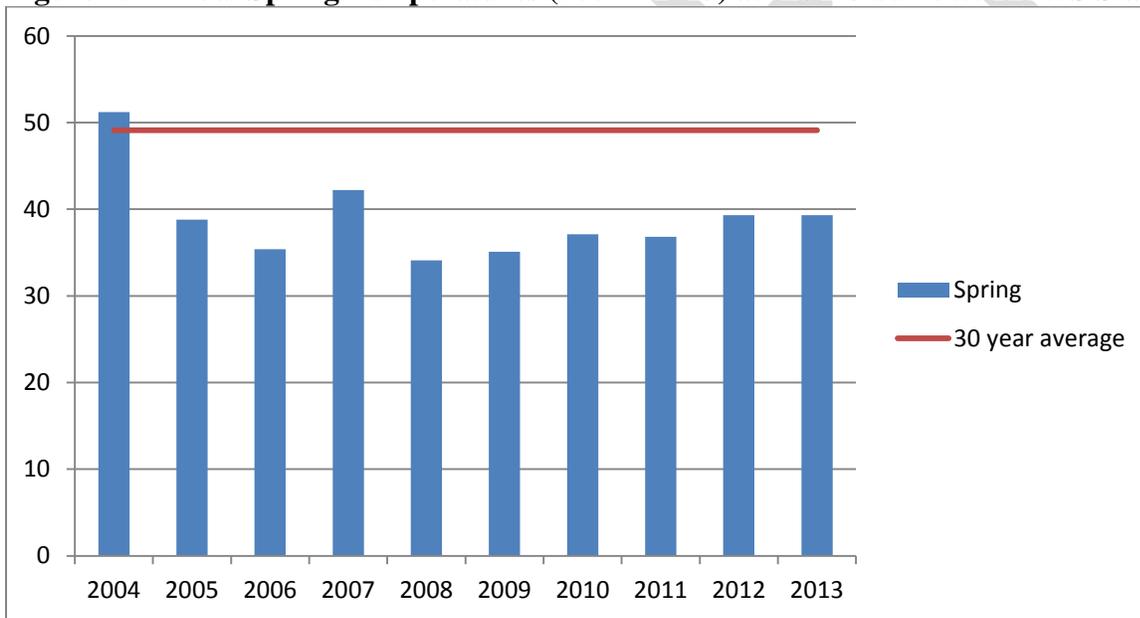


Figure 2: Annual Spring Temperatures (2004 – 2013) at the Horse Butte RAWs Station



Grazing Management

Since 1990, both allotments were managed under the Tews Land & Livestock, Inc.’s Livestock Management Plan. In 2004, the grazing permit was transferred from Tews Land & Livestock to Cedar Creek Cattle Company. In April, 2014, the grazing permit was transferred from Cedar Creek Cattle Company to JRS Properties III LP.

Cattle grazing occurs mostly in the late spring and early summer months as two herds move from winter use areas near Coonskin Butte to summer use areas in the Jarbidge Foothills and Humboldt-Toiyabe National Forest, then again in the fall as they return to the Coonskin and East Juniper Draw Allotments.

The current grazing permit for the Camas Slough Allotment authorizes 252 AUMs and the permitted season of use is March 1 to February 28.

The current grazing permit for the Grassy Hills Allotment authorizes 852 AUMs and the permitted season of use is March 1 to February 28.

Table 3: Acreage by allotment, pasture and ownership for the Camas Slough Allotment

Pasture	BLM	State	Private	Total
Camas Slough	1,582	0	0	1,582
Wildlife Exclosure	22	0	0	22
Allotment Total	1,603	0	0	1,603

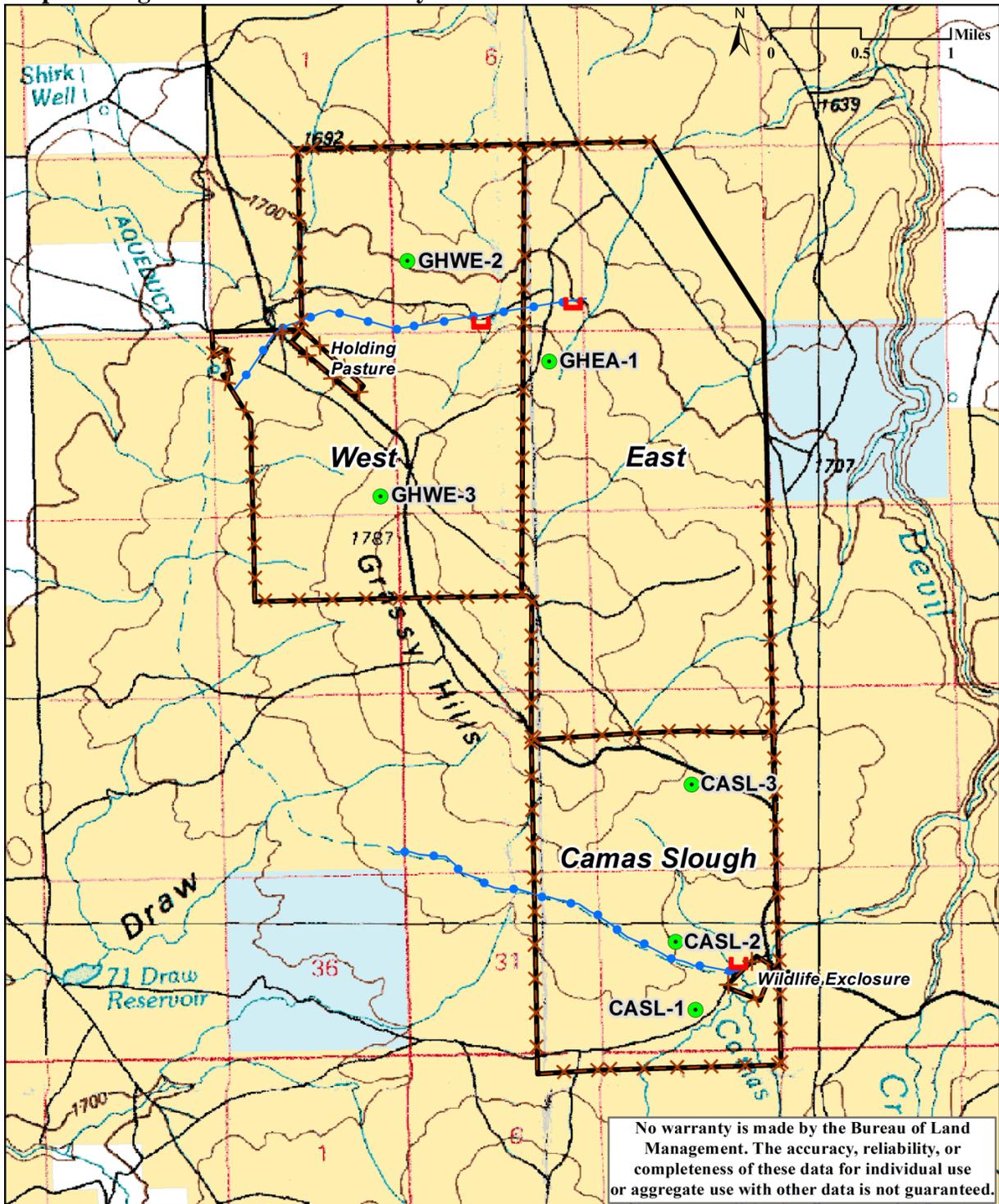
Table 4: Acreage by allotment, pasture and ownership for the Grassy Hills Allotment

Pasture	BLM	State	Private	Total
East	2,627	0	0	2,627
West	2,257	0	0	2,257
Holding Pasture	24	0	0	24
Allotment Total	4,908	0	0	4,908

The Camas Slough Allotment contains one main pasture, which is 1,582 acres, with a small wildlife exclosure around part of a wetland that consists of 21 acres. The allotment has only one pasture formed by 6.4 miles of fence. In 1990, nesting islands were constructed in the Camas Slough Reservoir and the reservoir dam was reconstructed. About 0.75 miles of fence was constructed to protect the Camas Slough pond and a portion of the wetland. This wetland is in the southeastern portion of the allotment. About 1.1 miles of pipeline crosses the allotment and provides water to a trough and pond near (100 feet) from the Camas Slough fence. The trough is the only reliable water source for the allotment.

The Grassy Hills Allotment consists of the East Pasture (2,627 acres), the West Pasture (2,257 acres) and the Holding Pasture (24 acres). The allotment boundary is formed by approximately 12.3 miles of fence. About 1.3 miles of the boundary fence is shared with the Camas Slough Allotment. Approximately 2.5 miles of fence divides the Grassy Hills Allotment into two pastures. Approximately 1.1 miles of fence forms a 24 acre holding pasture in the West Pasture. Corrals and loading facilities by the holding pasture add another 0.4 miles of fence. A 20 acre fire rehabilitation exclosure is delineated by 0.5 miles of fence on the east side of the West Pasture. Approximately 2.1 miles of pipeline supplies water to a trough in a holding pasture as well as one trough each in the East and West Pastures. In addition to the water troughs, three ponds in the West Pasture contain water in the spring but are dry in the summer. The East Pasture has five ponds which seasonally catch and retain water. All the ponds are in draws and trap run-off during the spring. Three upland intermittent wetlands are present in the east side of the East Pasture of the Grassy Hills Allotment.

Map 2: Range Infrastructure and Key Utilization Sites



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Camas Slough and Grassy Hills Allotments & Pastures	Trough	Bureau of Land Management
Key Utilization Site	Fence	Private; other
	Pipeline	State

Since 2005, the allotments have been managed under the Stipulated Settlement Agreement (SSA) (Case No. CV-04-181-S-BLW). The Camas Slough (#01095) and Grassy Hills (#01029) Allotments grazing permit is managed under the interim grazing measures in the Stipulated Settlement Agreement ordered by Chief Judge Winmill on October 20, 2005 (SSA), and modified on January 20, 2011, which includes managing livestock under an annual grazing plan (AGP) implemented at the beginning of each grazing year.

A summary of actual use and average utilization in the allotments from 2003 to 2013 can be seen above in Table 5 and 6 and locations of key utilization sites are shown in Map 2. Utilization data was not collected during 2007 and 2008 because the allotments burned and was closed to grazing to facilitate vegetation recovery. A summary of actual use is provided in Tables 5 thru 8 and Tables 7 and 8 also provide utilization on key species.

Grass species, on which utilization has been measured, include crested wheatgrass (*Agropyron cristatum*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), and Idaho fescue (*Festuca idahoensis*). Use on western wheatgrass (*Pascopyrum smithii*) was checked once in 2004 and was approximately 26% in the West Pasture. Utilization data was collected using the Height-Weight Method (Cooperative Extension Service et al., 1999).

The average utilization in the Camas Slough Allotment since 2004 has been 5.9% on Idaho fescue. The average utilization in the Grassy Hills Allotment during the same time period was 12.1% on native grass species (bluebunch wheatgrass and Idaho fescue) and 11.5% and 19.8% on crested wheatgrass in the East and West Pasture, respectively.

Table 5: Camas Slough Allotment Actual Use

Year	Livestock Numbers	Dates	AUM's Utilized	Total AUM's
2003	150	6/10 – 6/13	20	
	326	6/14 – 6/15	21	
	247	6/26 - 6/27	16	
2004	600	7/12 – 7/12	20	77
	550	6/29 – 6/29	18	
	440	7/09 – 7/13	72	90
2005	352	6/28 – 7/11	162	162
2006	685	7/06 – 7/06	23	23
2007	350	7/06 – 7/17	138	
	239	7/19 – 7/19	8	146
2008*	0			0
2009	225	6/30 – 7/10	81	
	225	7/09 – 7/10	15	96
2010	454	7/01 – 7/11	164	
	508	7/25 – 7/25	17	181
2011	610	6/04 – 6/10	140	140
2012	400	6/15 – 6/20	79	
	450	6/21 – 6/25	74	
	590	7/07 – 7/07	19	173
2013	566	6/08 – 6/11	74	
	300	6/30 – 7/08	89	163

* Allotment closed due to 2007 Murphy Complex Fire

Table 6: Grassy Hills Allotment Actual Use

Year	Livestock Number	Dates	AUM's Utilized	Total AUM's
2003	700	6/01 – 6/09	207	
	550	6/10 – 6/13	72	
	374	6/14 – 6/25	148	
	127	6/26 – 6/30	21	
	335	7/01 – 7/09	99	
2004	600	7/10 – 7/11	39	586
	550	6/03 – 6/28	470	
	440	7/08 – 7/08	14	484
2005	352	6/16 – 6/27	139	
	500	6/28 – 7/26	477	616
2006	685	6/17 – 7/05	428	428
2007	350	6/06 – 7/05	345	
	239	6/24 – 7/18	196	541
2008*	0			0
2009	450	5/27 – 6/4	133	
	225	6/05 – 7/07	244	
	225	6/05 – 6/29	185	
	225	7/08 – 7/08	7	569
2010	454	6/12 – 6/30	284	
	508	7/04 – 7/24	351	635

Year	Livestock Number	Dates	AUM's Utilized	Total AUM's
2011	300	5/01 – 5/04	39	
	610	5/05 – 6/03	602	641
2012	400	5/25 – 6/14	276	
	640	6/19 – 6/20	42	
	590	6/21 – 7/06	310	628
2013	400	5/08 – 5/22	197	
	566	5/23 – 6/07	298	
	300	6/26 – 6/29	39	534

* Allotment closed due to 2007 Murphy Complex Fire

Table 7: Actual Use and Utilization Summary for Camas Slough Allotment

Permittee	Year	Actual Use		Utilization		
		Season of Use	AUMs	Bluebunch Wheatgrass	Idaho Fescue	Sandberg Bluegrass
Tews Land & Livestock	2003	2,3	77	ND	ND	ND
	2004	3	90	ND	ND	ND
Cedar Creek Cattle Co.	2005	3	162	16%	5%	16.5%
	2006	3	23	ND	4%	ND
	2007*	3	146	Burned	Burned	Burned
	2008 ^A	No Use	0	Closed	Closed	Closed
	2009	3	96	ND	4%	ND
	2010	3	181	ND	5%	ND
	2011	2	140	ND	5.5%	ND
	2012	2,3	173	ND	7%	ND
	2013	2,3	163	ND	11%	ND

1 = Spring (04/20 – 05/31), 2 = Early Summer (06/01 – 06/20); 3 = Summer (06/21 – 07/31)

ND = No data collected

*The allotment burned in the Murphy Complex Fire before utilization was read

^AThe allotment was closed to grazing in 2008 to allow recovery following the 2007 fire

Table 8: Actual Use and Utilization Summary for Grassy Hills Allotment

Permittee	Year	Actual Use		Utilization							
		Season of Use	AUMs	Crested Wheatgrass		Bluebunch Wheatgrass		Idaho Fescue		Sandberg Bluegrass	
<i>Pasture</i>				<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>
Tews Land & Livestock	2003	2,3	586	ND	ND	ND	ND	ND	ND	ND	ND
	2004	2,3	484	12%	34%	26%	26%	ND	15%	6%	ND
Cedar Creek Cattle Co.	2005	2,3	616	ND	21%	ND	13%	ND	ND	ND	ND
	2006	2,3	428	5%	13%	3%	6%	ND	ND	ND	50%
	2007*	2,3	541	Burn	Burn	Burn	Burn	Burn	Burn	Burn	Burn
	2008 ^A	No Use	0	Close	Close	Close	Close	Close	Close	Close	Close
	2009	1,2,3	569	18%	23%	9%	14%	ND	8%	ND	ND
	2010 ^B	2,3	635	ND	ND	ND	ND	ND	ND	ND	ND

Permittee	Year	Actual Use		Utilization							
		Season of Use	AUMs	Crested Wheatgrass		Bluebunch Wheatgrass		Idaho Fescue		Sandberg Bluegrass	
<i>Pasture</i>				<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>	<i>East</i>	<i>West</i>
	2011	1,2	641	ND	ND	0%	0%	ND	ND	ND	ND
	2012	1,2,3	628	ND	ND	8%	3%	ND	ND	ND	ND
	2013	1,2,3	534	11%	8%	22%	4%	ND	ND	ND	ND

1 = Spring (04/20 – 05/31), 2 = Early Summer (06/01 – 06/20); 3 = Summer (06/21 – 07/31)

ND = No data collected

*The allotment burned in the Murphy Complex Fire before utilization was read

^AThe allotment was closed to grazing in 2008 to allow recovery following the 2007 fire

^BEnd use was not read due to early snow which precluded access

Vegetation

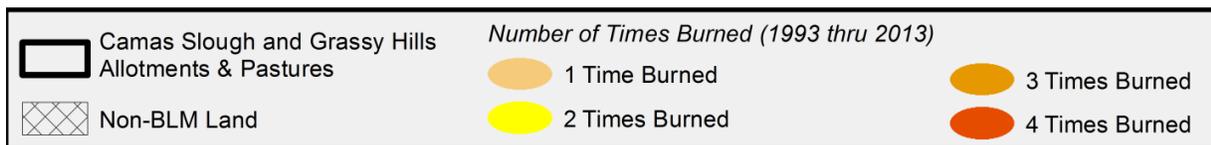
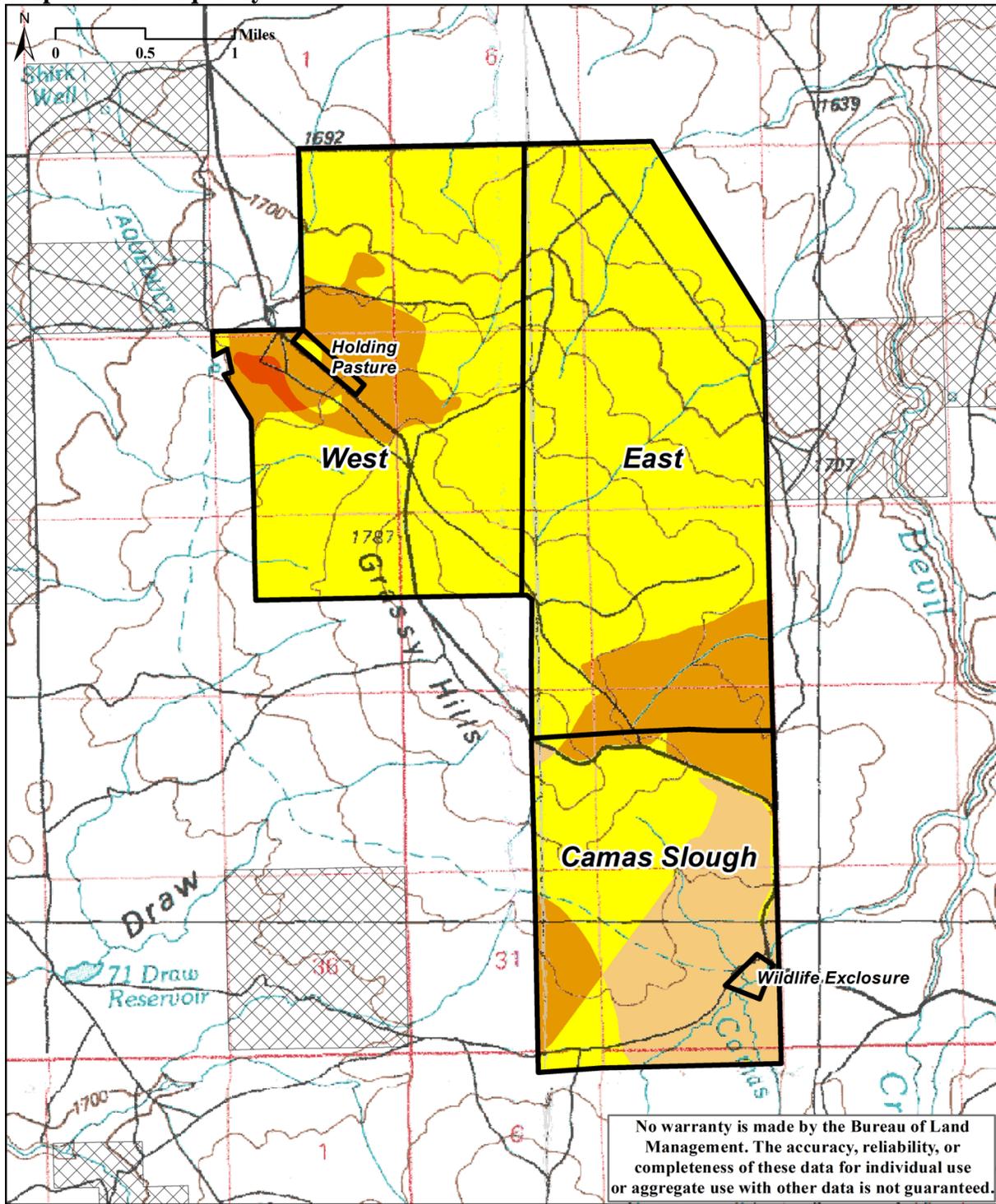
Vegetation in Camas Slough and Grassy Hills Allotments was initially mapped in 2006 using field observation, field cover data, and 2004 National Agriculture Imagery Program (NAIP) imagery. The vegetation map was updated in 2013 using field observations and NAIP imagery (Map 4). Vegetation communities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

Historically, both allotments were shrub-steppe plant communities; however, both have been affected by wildfire and subsequent rehabilitation efforts have resulted in perennial grass communities that contain little to no brush component. Table 9 and Map 3 illustrate fire frequency in the Camas Slough and Grassy Hills Allotments.

Table 9: Fire Frequency by Pasture from 1993 to 2012

Pasture	Number of Times Burned from 1993 to 2012	Acres Of Pasture Burned	Percentage of Pasture
Camas Slough	1	690	43%
	2	657	41%
	3	258	16%
Grassy Hills - West Pasture	2	1,834	80%
	3	429	19%
	4	33	1%
Grassy Hills - East Pasture	2	2,248	86%
	3	376	14%

Map 3: Fire Frequency



Between the 1958 Grassy Hill and the 1960 Grassy Hills Fire, approximately 423 acres (27%) of the main pasture burned in the Camas Slough Allotment. The 1960 Grassy Hills Fire burned approximately 1,589 acres (60%) of the East Pasture, 24 acres (100%) of the Holding Pasture, and 2,257 acres (100%) in the West Pasture in the Grassy Hills Allotment. In the fall, 1960 and spring, 1961, portions of the Grassy Hills Allotment were seeded to crested wheatgrass to rehabilitate areas burned by wildfire in 1960.

The 1980 Devils Creek 2 Fire burned approximately 12 acres (23%) of the wildlife enclosure and 527 acres (33%) of the main pasture in the Camas Slough Allotment and 493 acres (19%) of the East Pasture in the Grassy Hills Allotment. No fire rehabilitation information is available for this fire.

The 1981 Windmill Fire burned approximately 327 acres (14%) of the West Pasture in the Grassy Hills Allotment. No fire rehabilitation information is available for this fire.

The 1985 Hellwell Fire burned approximately 1 acre (4%) of the Holding Pasture and 670 acres (16%) of the West Pasture in the Grassy Hills Allotment. Following the fire, the burned area was drill seeded with a mix of Intermediate wheatgrass, 'Fairway' crested wheatgrass, small burnett, and fourwing saltbush. In spring, 1986, the burned area was aerially seeded with 'Nomad' alfalfa.

The 1995 Signal Butte Fire burned approximately 816 acres (52%) of the main pasture in the Camas Slough Allotment and 374 acres (14%) of the East Pasture in the Grassy Hills Allotment. No fire rehabilitation information is available for this fire.

The 1998 Roseworth 1 Fire burned approximately 24 acres (100%) of the Holding Pasture and 420 acres (19%) of the West Pasture in the Grassy Hills Allotment. No fire rehabilitation information is available for this fire.

Three fires in 2000, the 5N Three Creek, Grass, and Worley Draw Fires, burned an approximate total of 358 acres (22%) of the main pasture in the Camas Slough Allotment. The 2000 Grass Fire burned approximately 2,450 acres (93%) of the East Pasture, 17 acres (71%) of the Holding Pasture and 2,171 acres (96%) of the West Pasture in the Grassy Hills Allotment. In addition, the Worley Draw Fire burned approximately 177 acres (7%) of the East Pasture in the Grassy Hills Allotment. Following the Worley Draw Fire, the burned area was aerially seeded with a mix of "Appar" Lewis flax, Western yarrow, and Wyoming big sagebrush. Additionally, after the Grass Fire, cultivars of bluebunch wheatgrass were aerially seeded.

The 2006 Old Wind Fire burned approximately 148 acres (7%) of the West Pasture in the Grassy Hills Allotment. The fire rehabilitation plan did not prescribe seeding the burned area; however, planting of Wyoming sagebrush seedlings was planned. This action was not completed due to the 2007 Murphy Complex Fire.

The 2007 Murphy Complex Fire burned approximately 1,582 acres (100%) of the main pasture and 22 acres (100%) of the wildlife enclosure in the Camas Slough Allotment and 2,627 acres (100%) of the East Pasture, 24 acres (100%) of the Holding Pasture and 2,257 acres (100%) of

the West Pasture in the Grassy Hills Allotment. The affected areas were aerially seeded with Wyoming big sagebrush post-fire but the fire rehabilitation plan did not prescribe drill seeding within the Camas Slough and Grassy Hills Allotments.

As a result of the fires and seeding efforts, plant communities have been modified. The Camas Slough and Grassy Hills Allotments are predominantly vegetated with a mixture of perennial and annual grass species, with little to no brush component (Table 10; Map 3). Seeding efforts began as early as 1960 and have continued following wildfires. Various drill and aerial seeding efforts have been undertaken to rehabilitate areas burned by wildfire and have resulted in the current vegetative community. These seedings have contributed to the current vegetative community which is a mixture of native, native cultivars and seeded non-native perennial grass species occurring throughout the majority of the West Pasture of the Grassy Hills Allotment, while the East Pasture of the Grassy Hills Allotment and the Camas Slough Allotment are generally native grasslands. Repeated wildfires have also increased yellow rabbitbrush (*Chrysothamnus viscidiflorus*) in patches.

Vegetation mapping is based on highest percent cover; therefore, current vegetation mapping shows the allotment as predominantly a Sandberg bluegrass vegetation community. The map is not intended to display the production of the perennial bunchgrasses.

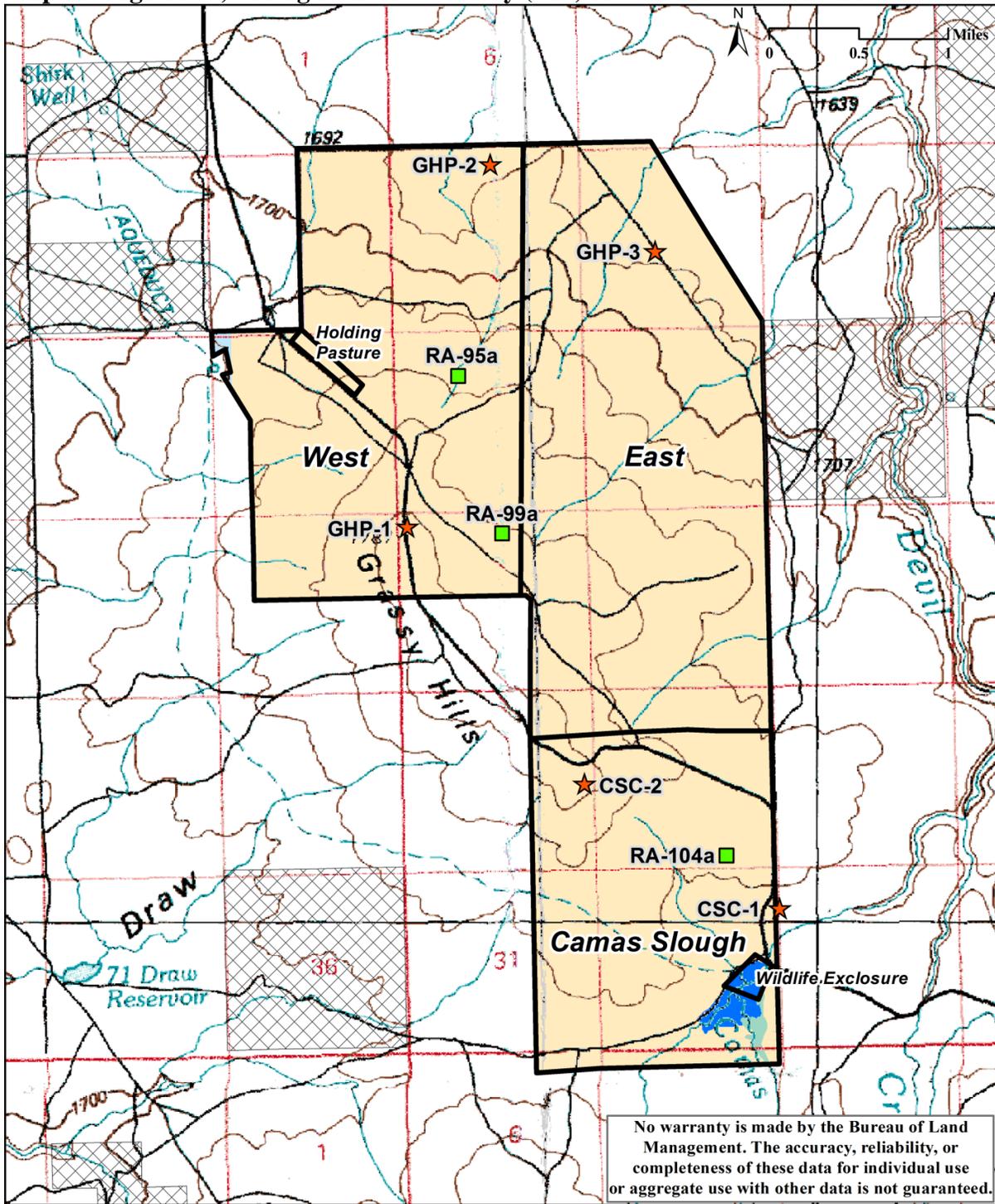
Table 10: Vegetation Communities in Acres and Percentage by Pasture*

Pasture	Sandberg bluegrass	Bluebunch wheatgrass	Semi-Wet Meadow
Camas Slough	1,538 (96%)	0 (0%)	67 (4%)
Grassy Hills – West Pasture	2,270 (99.5%)	11(0.5%)	0 (0%)
Grassy Hills – East Pasture	2,623 (100%)	0 (0%)	0 (0%)

* Vegetation community is listed by dominate cover species. Numerous other plant species, both native and non-native, are present in the communities.

One Ecological Site Inventory (ESI) site is located in the Camas Slough Allotment and two ESI sites are located in the Grassy Hills Allotment. Vegetative production data recorded during the 2006 ESI is summarized in Table 11. Due to differences in sampling locations and methodology (e.g. number of transects per site and number of points per transect) among the 2003 cover data, 2004 production data, 2006 ESI data and the 2012 sage-grouse Habitat Assessment Framework (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.

Map 4: Vegetation, Ecological Site Inventory (ESI) & Production and/or Cover Plots



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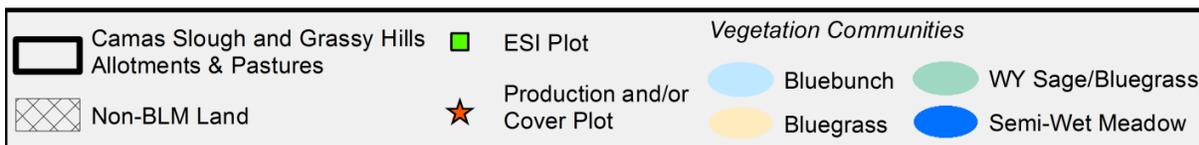


Table 11: Summary of 2006 Ecological Site Inventory Production Data (Total Dry Weight in Pounds per Acre)

Vegetation Class	Species	Allotment		
		Camas Slough	Grassy Hills – West Pasture	
		Site RA-104a	Site RA-95a	Site RA-99a
Perennial Grasses	Idaho fescue	362.0	64.0	18.3
	Crested wheatgrass	0.0	0.0	93.4
	Sandberg bluegrass	11.3	37.8	12.4
	Squirreltail	9.0	2.8	5.3
	Bluebunch wheagrass	0.0	233.6	342.5
	Thickspike wheatgrass	0.0	6.4	6.4
	Bulbous bluegrass	0.0	0.0	2.5
	Basin wildrye	0.0	0.0	100.2
	Western wheatgrass	9.0	0.0	0.0
Annual Grasses	Cheatgrass	0.0	0.0	0.0
	Sixweeks fescue	0.0	0.0	5.0
Perennial Forbs	Tapertip hawksbeard	0.0	0.0	0.0
	Longleaf phlox	0.0	0.7	0.0
	Pale agoseris	0.0	3.0	0.0
	Lupine	7.0	12.0	6.0
Annual Forbs	Tall tumble mustard	0.0	0.0	0.0
	Tall annual willowherb	0.6	2.0	1.0
Shrubs	Yellow rabbitbrush	106.7	0.0	194.8
	Wyoming big sagebrush	0.0	0.0	0.0
	Little sagebrush	7.2	0.0	0.0
TOTAL		512.8	355.9	787.8

In 2004, production data was collected in the Grassy Hills Allotment (Table 12). Two of those sites (GHP-1 and GHP-3) were in bluebunch wheatgrass seedings while one site (GHP-2) was located in a crested wheatgrass seeding.

Table 12: Summary of 2004 Production Data (Total Dry Weight in Pounds per Acre)

Vegetation Class	Species	Grassy Hills Allotment		
		West Pasture		East Pasture
		GHP-1	GHP-2	GHP-3
Perennial Grasses	Idaho fescue	79.0	0.0	1.0
	Crested wheatgrass	32.0	654.0	96.0
	Sandberg bluegrass	53.0	76.0	222.0
	Squirreltail	17.0	0.0	0.0
	Bluebunch wheagrass	458.0	169.0	489.0
	Intermediate wheatgrass	0.0	2.0	0.0
	Western wheatgrass	7.0	0.0	0.0
Annual	Cheatgrass	13.0	0.0	0.0

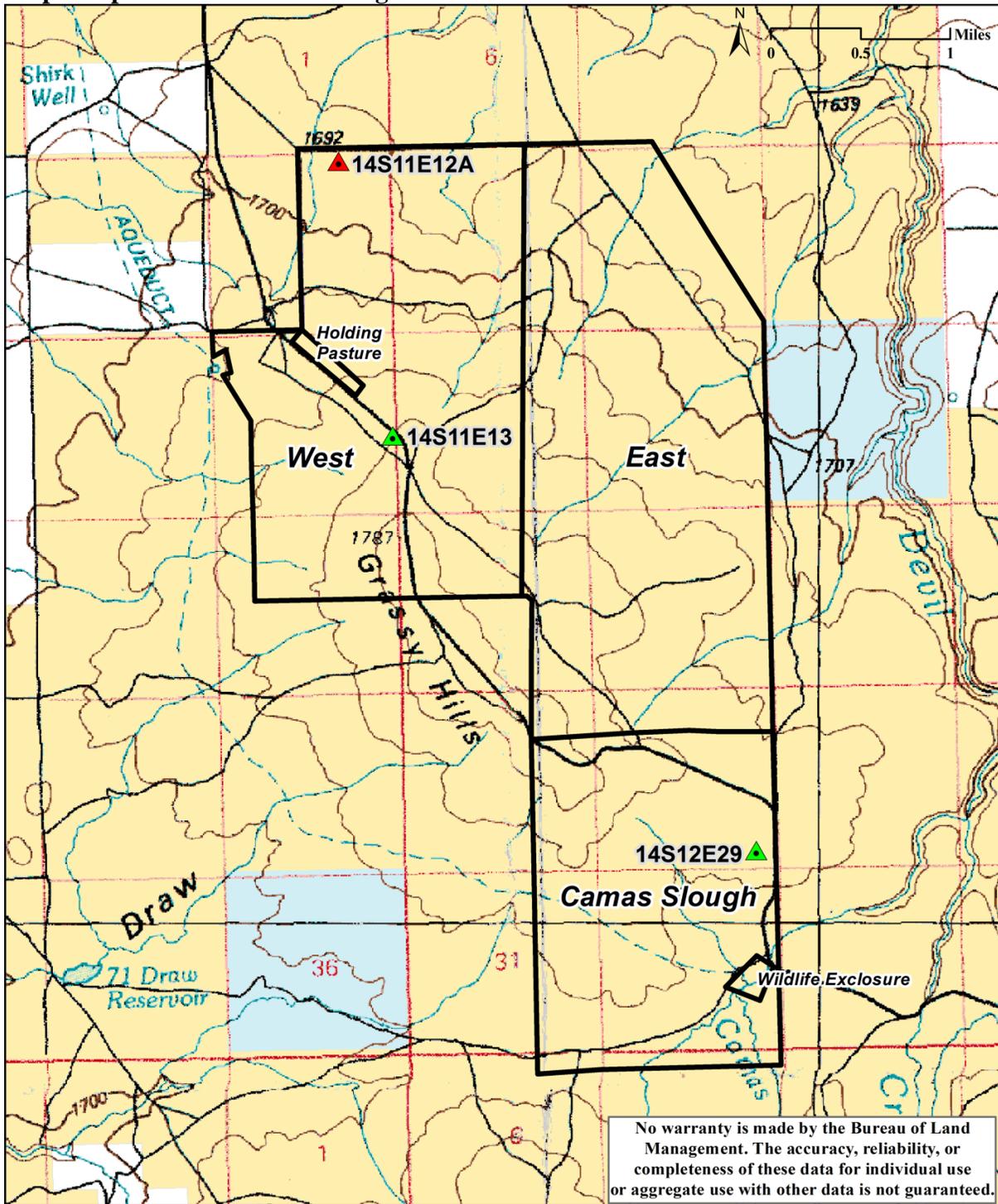
Vegetation Class	Species	Grassy Hills Allotment		
		West Pasture		East Pasture
		GHP-1	GHP-2	GHP-3
Grasses	Sixweeks fescue	0.0	0.0	0.0
Perennial Forbs	Misc perennial forbs	5.0	0.0	19.0
	Longleaf phlox	2.0	6.0	25.0
	Small blue eyed Mary	37.0	0.0	0.0
	Deathcamas	0.0	0.0	11.0
	Lupine	111.0	71.0	0.0
Annual Forbs	Tall tumblemustard	0.0	0.0	0.0
	Misc annual forbs	3.0	0.0	1.0
Shrubs	Yellow rabbitbrush	0.0	56.0	0.0
	Wyoming big sagebrush	80.0	0.0	0.0
TOTAL FORAGE PRODUCTION		646.0	901.0	808.0
TOTAL PRODUCTION		897.0	1034.0	864.0

Upland Trend Data

Upland trend monitoring sites have been established in the Camas Slough Allotment and the West Pasture of the Grassy Hills Allotment (Map 5). Both Nested Frequency and Photo Plot protocols have been used to collect data at the sites (BLM, 1996). Nested frequency records the frequency of plant species at each site while vegetative plant cover is recorded within the photo plots. One site was established within the Camas Slough Allotment and one site was established in the West Pasture of the Grassy Hills Allotment. Both sites have been burned by wildfire since 2007. A short overview of upland trend monitoring is included below; nevertheless, the effects of fire and subsequent drill seedings on vegetation should be considered when comparisons of current trend data are made to the previously collected trend data. Essentially, the trend data following the fire is the new baseline for future comparisons for each site. Furthermore, tables displaying summarized trend data can be viewed at the JFO.

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

Map 5: Upland Trend Monitoring Sites



Camas Slough Allotment:

One long-term nested frequency site has been established in the Camas Slough Allotment.

Trend Site 14S12E29:

Site 14S12E29 (Photo 1 and 2) is located within a Claypan 12-16" low sagebrush/Idaho fescue/bluebunch wheatgrass (R025XY010ID) ecological site. The site was initially read in 1987 and re-read in 1991, 1998 and 2012. This site burned in the 2007 Murphy Complex and was subsequently aerielly seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2012 data to the 1991 and 1998 data would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2012 trend reading is discussed below to show the general recovery and current baseline of the site.

Photo 1: Overview of Trend Site 14S12E29 dated June 29, 1998



Photo 2: Overview of Trend Site 14S12E29 dated June 27, 2012



The key species at the site are Sandberg bluegrass, Idaho fescue and bluebunch wheatgrass. The number of occurrences for comparison between years is based on plot 2 within the nested frequency frame for Idaho fescue and plot 4 for Sandberg bluegrass and bluebunch wheatgrass. The frequency of Sandberg bluegrass has increased from 95 occurrences in 1991 to 99 occurrences in 1998 to 100 occurrences in 2012. Idaho fescue has increased from 65 occurrences in 1991 to 92 occurrences in 1998 and then decreased to 70 occurrences in 2012. Bluebunch wheatgrass increased from 24 occurrences in 1991 to 25 occurrences in 1998 to 52 occurrences in 2012. Although the site burned in the 2007 Murphy Complex Fire, the perennial bunchgrasses did not decline but wildfire significantly reduced the sagebrush component.

Perennial and annual forbs (based on plot 4) have increased from 69 occurrences in 2000 to 117 occurrences in 1998 and decreased to 107 occurrences in 2012. While the total forb occurrences have likely increased, this may also due to the timing of data collection, precipitation and temperature. Twelve species of forbs were recorded at the site. A common species of perennial forbs at the site included longleaf phlox (*Phlox longifolia*). Common annual forbs included maiden blue eyed Mary (*Collinsia parviflora*) and slender phlox (*Microsteris gracilis*).

Table 13: Camas Slough Allotment Trend Site 14S12E29 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences		
		1991	1998	2012
Idaho fescue	2	65	92	70
Bluebunch wheatgrass	4	24	25	52
Sandberg bluegrass	4	95	99	100
Squirreltail	4	30	49	NR
Cheatgrass	4	0	8	NR
Clover	4	0	0	4
Longleaf phlox	4	0	1	3
Slender phlox	4	0	0	15
Fleabane	4	0	17	0
Maiden blue eyed Mary	4	0	96	78
Aster	4	6	0	0
Pale agoseris	4	0	0	2
Yellow salsify	4	2	2	0
Goatsbeard	4	0	0	0
Western stoneseed	4	61	0	0
Unknown perennial forb	4	6	1	0
Fireweed	4	0	0	5
Yellow rabbitbrush	4	1	1	1
Low sagebrush	4	1	5	0
Basin big sagebrush	4	NR	NR	NR
Wyoming big sagebrush	4	2	1	1

NR-Not Recorded

Bare ground has decreased at the site from 65.0 percent in 1991 to 21.0 percent in 1998 to 5.75 percent in 2012. Vegetation cover has decreased from 25.75 percent in 1991 to 14.25 percent in 1998 and then increased to 20.25 in 2012. Biological crust was recorded at 0.0 percent in 1991, then as 2.75 percent in 1998 and 16.25 percent in 2012.

Data collected at the 3x3 photo plot at the site shows that from 1998 to 2012, bluebunch wheatgrass decreased from 9.8 percent to 5.95 percent, Idaho fescue increased from 14.0 percent to 14.7 percent and Sandberg bluegrass decreased from 11.2 percent to 3.92 percent.

Grassy Hills Allotment:

One long-term nested frequency has been established in the West Pasture of the Grassy Hills Allotment.

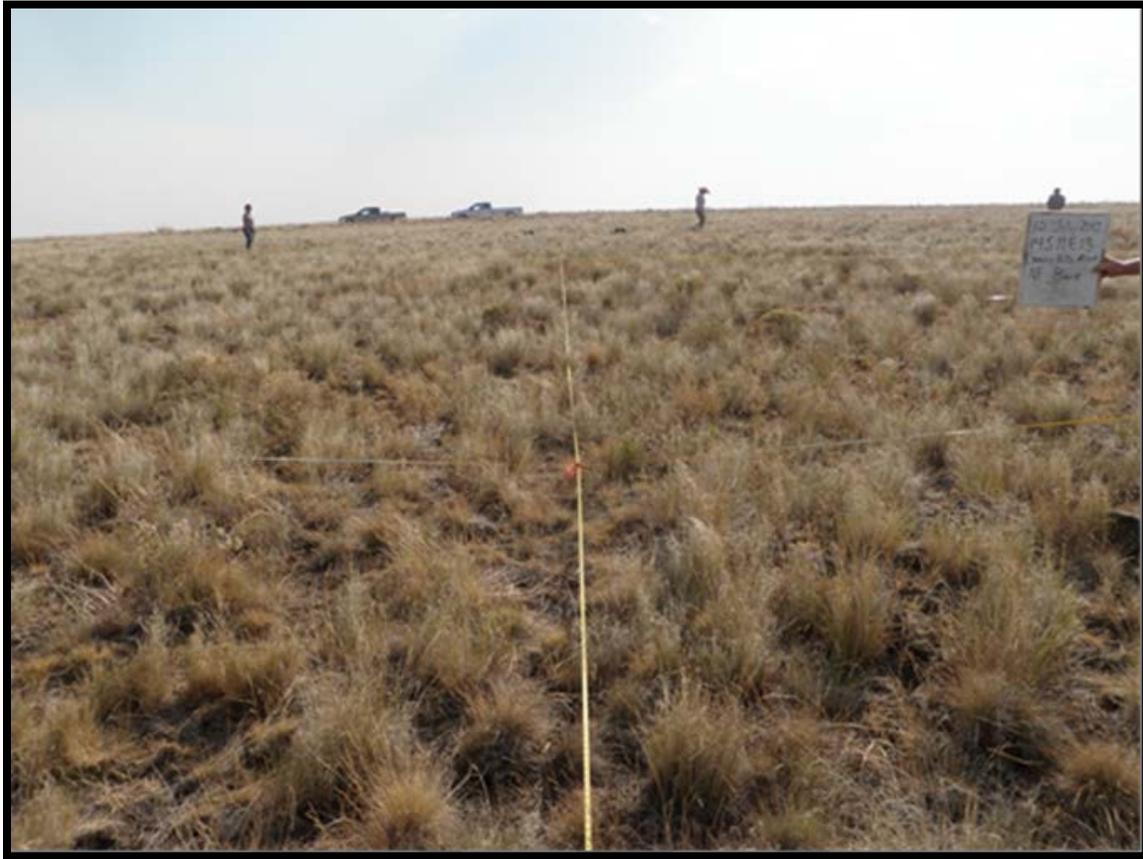
Trend Site 14S11E13:

Site 14S11E13 (Photo 3 and 4) is located within a Loamy 12-16" Basin big sagebrush/Idaho fescue/bluebunch wheatgrass (R025XY024ED) ecological site. The site was initially read in 2000 and re-read in 2012. This site burned in the 2007 Murphy Complex and was subsequently aerially seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2012 data to the 2000 data would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2012 trend reading is discussed below to show the general recovery and current baseline of the site.

Photo 3: Overview of Trend Site 14S11E13 dated July 18, 2000



Photo 4: Overview of Trend Site 14S11E13 dated July 10, 2012



The key species at the site are Bluebunch wheatgrass and Sandberg bluegrass. The number of occurrences for comparison between years is based on plot 2 within the nested frequency frame for Bluebunch wheatgrass and plot 1 for Sandberg bluegrass. The frequency of bluebunch wheatgrass decreased from 77 occurrences in 2000 to 74 occurrences in 2012. Sandberg bluegrass has increased from 7 occurrences in 2000 to 46 occurrences in 2012. Although the site burned in the 2007 Murphy Complex Fire, bluebunch wheatgrass did not decline significantly but wildfire significantly reduced the sagebrush component.

Perennial and annual forbs (based on plot 4) have increased from 93 occurrences in 2000 to 256 occurrences in 2012. While the total forb occurrences have likely increased, this may also due to the timing of data collection, precipitation and temperature. Nineteen species of forbs were recorded at the site. Common species of perennial forbs at the site included longleaf phlox (*Phlox longifolia*) and lupine (*Lupinus*). Common annual forbs included maiden blue eyed Mary (*Collinsia parviflora*), slender phlox (*Microsteris gracilis*), and tall annual willowherb (*Epilobium brachycarpum*).

Table 14: West Pasture of the Grassy Hills Allotment Trend Site 14S11E13 Nested Frequency Data Summary

Species or Vegetation Class	Plot	Occurrences	
		2000	2012
Thurber's needlegrass	4	0	5
Bluebunch wheatgrass	2	77	74
Sandberg bluegrass	1	7	46
Squirreltail	4	81	1
Cheatgrass	4	1	2
Crested wheatgrass	4	1	20
Western wheatgrass	4	0	4
Lupine	4	0	17
Longleaf phlox	4	38	60
Slender phlox	4	NR	37
Strict forget-me-not	4	0	6
Buckwheat	4	16	0
Maiden blue eyed Mary	4	0	32
Hairy balsamroot	4	0	4
Pale agoseris	4	0	7
Yellow salsify	4	0	1
Hawksbeard	4	0	4
Freckled milkvetch	4	0	2
Mourning milkvetch	4	0	4
Groundsmoke	4	0	15
Spring draba	4	0	11
Tall annual willowherb	4	0	27
Onion	4	39	0
Thistle	4	0	2
Clasping pepperweed	4	0	2
Chickweed	4	0	7
Yellow rabbitbrush	4	NR	18

NR-Not Recorded

Bare ground has decreased at the site from 55.0 percent in 2000 to 25.0 percent in 2012. Vegetation cover has decreased from 38.0 percent in 2000 to 19.0 in 2012. Biological crust was recorded at 0.0 percent in 2000 and as 6.0 percent in 2012.

Data collected in 2012 at the 3x3 photo plot at the site shows bluebunch wheatgrass was 26.6 percent cover and Sandberg bluegrass was 11.9 percent cover. No data was collected in 2000.

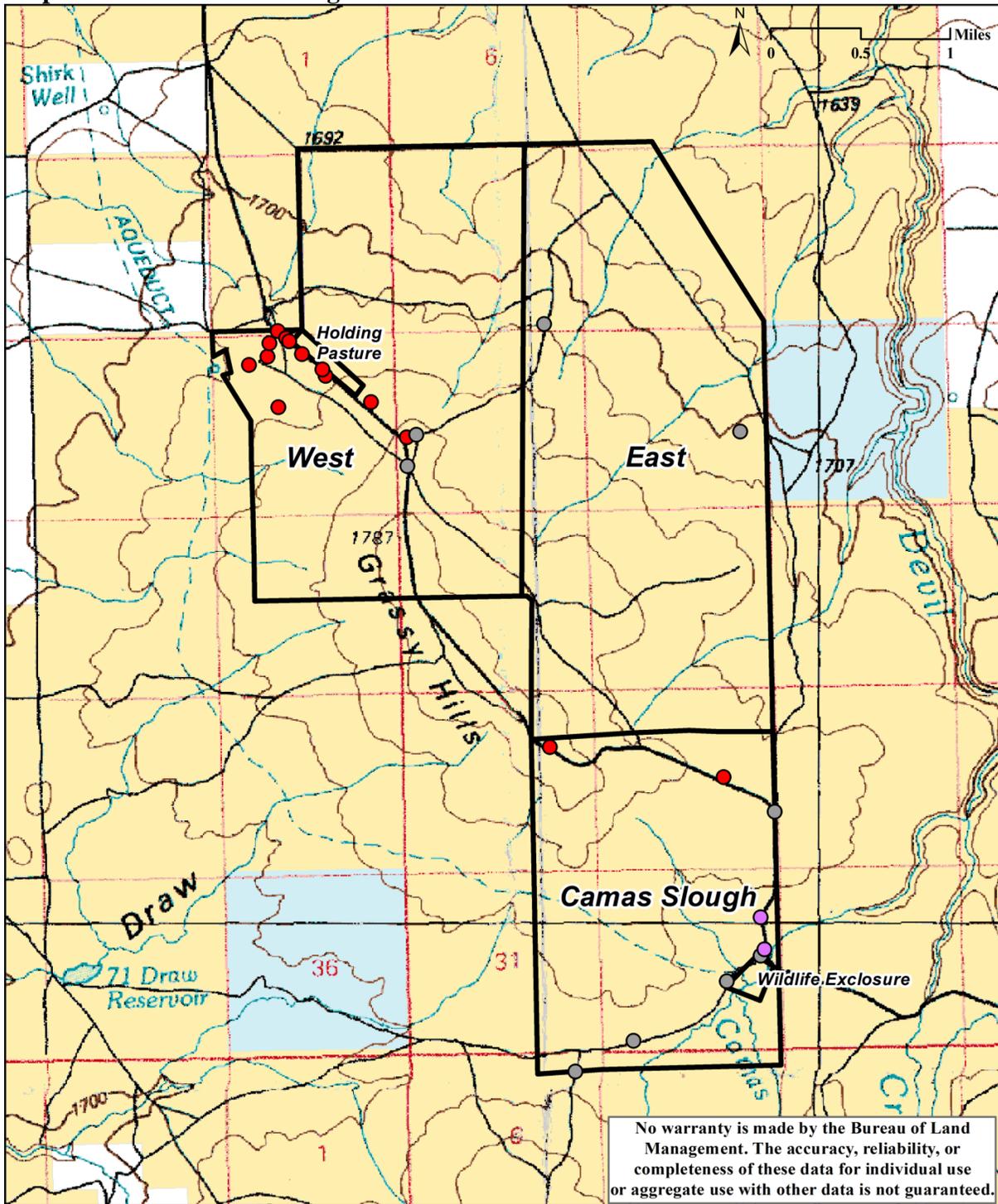
Noxious Weeds

The State of Idaho has listed 65 plant species as noxious weeds. Thirteen noxious weed species are known to occur within the Jarbidge Field Office boundary with 3 species occurring within the Camas Slough and Grassy Hills Allotments as of 2014 (Map 6).

The 3 species include Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acanthium*), and diffuse knapweed (*Centaurea diffusa*). In the Camas Slough Allotment, there are 5 known diffuse knapweed occurrences, 2 known Canada thistle occurrences and 2 known Scotch thistle occurrences. In the Grassy Hills Allotment, there are 4 known diffuse knapweed occurrences and 12 known Scotch thistle occurrences. All these occurrences were chemically treated in 2005 and again in 2008. Treatment goals are to reduce noxious weeds to where they will not have a significant economic or environmental impact and/or to eradicate them completely. The BLM also works to prevent the establishment of new species and infestations in areas where they presently do not occur.

Many of the known noxious weed infestations were 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 6: Noxious Weed Management



IDAHO RANGELAND HEALTH STANDARDS ASSESSMENT

There are eight standards for healthy rangelands that apply to BLM lands in the State of Idaho. Not all of the Standards apply to the Camas Slough and Grassy Hills Allotments due to variances in the land type and geographical area. Of the eight Idaho Standards for Rangeland Health, the following five standards are applicable to the allotments:

- **Standard 1** – Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, hydrologic cycling, and energy flow
- **Standard 2** – Riparian-wetland areas are in properly functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow
- **Standard 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 5** – 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
- **Standard 8** – Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species

**Standards 3, 6 and 7 do not apply to the Camas Slough or Grassy Hills Allotments*

Table 15: Standards Applicable to the Camas Slough and Grassy Hills Allotments.

Standard	Pastures
1	Camas Slough, East and West Pasture of Grassy Hills
2	Camas Slough
3	Not applicable
4	Camas Slough and East Pasture of Grassy Hills
5	West Pasture of Grassy Hills
6	Not applicable
7	Not applicable
8	Camas Slough, East and West Pasture of Grassy Hills

An interdisciplinary team (IDT) conducted IIRH field evaluations at two random sites representative of the plant communities within the Camas Slough and Grassy Hills Allotments on July 24, 2013. One site was located in the Camas Slough Allotment and the other site was located in the West Pasture of the Grassy Hills Allotment (Map 7). Indicators of rangeland health were used to evaluate three rangeland health attributes: soil and site stability, hydrologic function and biotic integrity (Idaho BLM, 2010). The Interpreting Indicators of Rangeland Health evaluation sheets were completed at each evaluation site. Photographs were taken of the evaluation sites and general field notes were composed. The field notes included information not

captured by the evaluation sheet (e.g. plant species list, wildlife sign, recreation impacts, and condition of range infrastructure, etc.) if they were found at the site. Both sites at which IIRH evaluations were conducted were 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 IDT 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 IDT 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.

Seventeen indicators of rangeland health (Table 16) were used to evaluate three rangeland health attributes (Table 17): 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 two sites in following the line point intercept method as described in the sage-grouse HAF (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.

In addition to evaluating rangeland health indicators at each site, the IDT examined other areas of the pastures to ensure evaluation sites were representative of the pasture and vegetation community. Data collected at evaluation sites were compared to the Natural Resource Conservation Service's (NRCS) ecological site description (ESD) reference sheet for the soil type and potential vegetation in the Camas Slough and Grassy Hills Allotments. The ESD reference sheet describes the expected condition of the ecological site in reference state.

The Camas Slough site occurs in the Claypan 12-16" low sagebrush/Idaho fescue ecological site (R025XY010ID). The NRCS ESD sheet calls what is commonly known as low sagebrush (*Artemisia arbuscula*) little sagebrush. This plant community should have low sagebrush dominate the overstory with Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) dominating the understory. Subdominant grasses may include Sandberg bluegrass (*Poa secunda*), squirreltail (*Elymus elymoides*), thick spike wheatgrass, (*Elymus lanceolatus*), and Thurber's needlegrass (*Achnatherum thurberianum*). The dominant forbs should be arrowleaf balsamroot (*Balsamorhiza sagittata*), Hooker's balsamroot (*Balsamorhiza hookeri*) and longleaf phlox (*Phlox longifolia*).

The ESD for the Grassy Hills West site occurred in the Loamy 12-16" Basin Big Sagebrush/Idaho fescue-bluebunch wheatgrass ecological site (R025XY024ID). This plant community should contain basin big sagebrush (*Artemisia tridentata tridentata*) as the dominant overstory plant, while the understory dominant grasses are a mix of Idaho fescue and bluebunch wheatgrass. Subdominant grass would include squirreltail. Other grasses may include Sandberg bluegrass and Thurber's needlegrass. The dominant forbs should be arrowleaf balsamroot and tapertip hawksbeard (*Crepis acuminata*).

DRAFT

Map 7: Idaho Indicators of Rangeland Health (IIRH) and Sage-grouse Habitat Assessment Framework (HAF) Sites

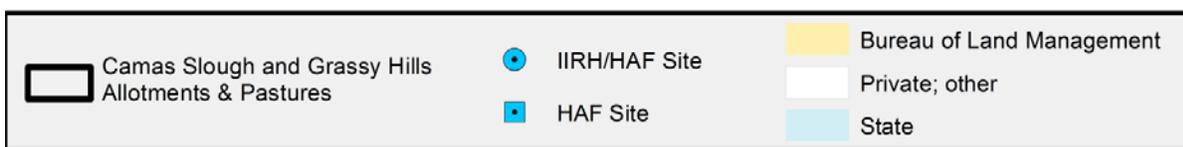
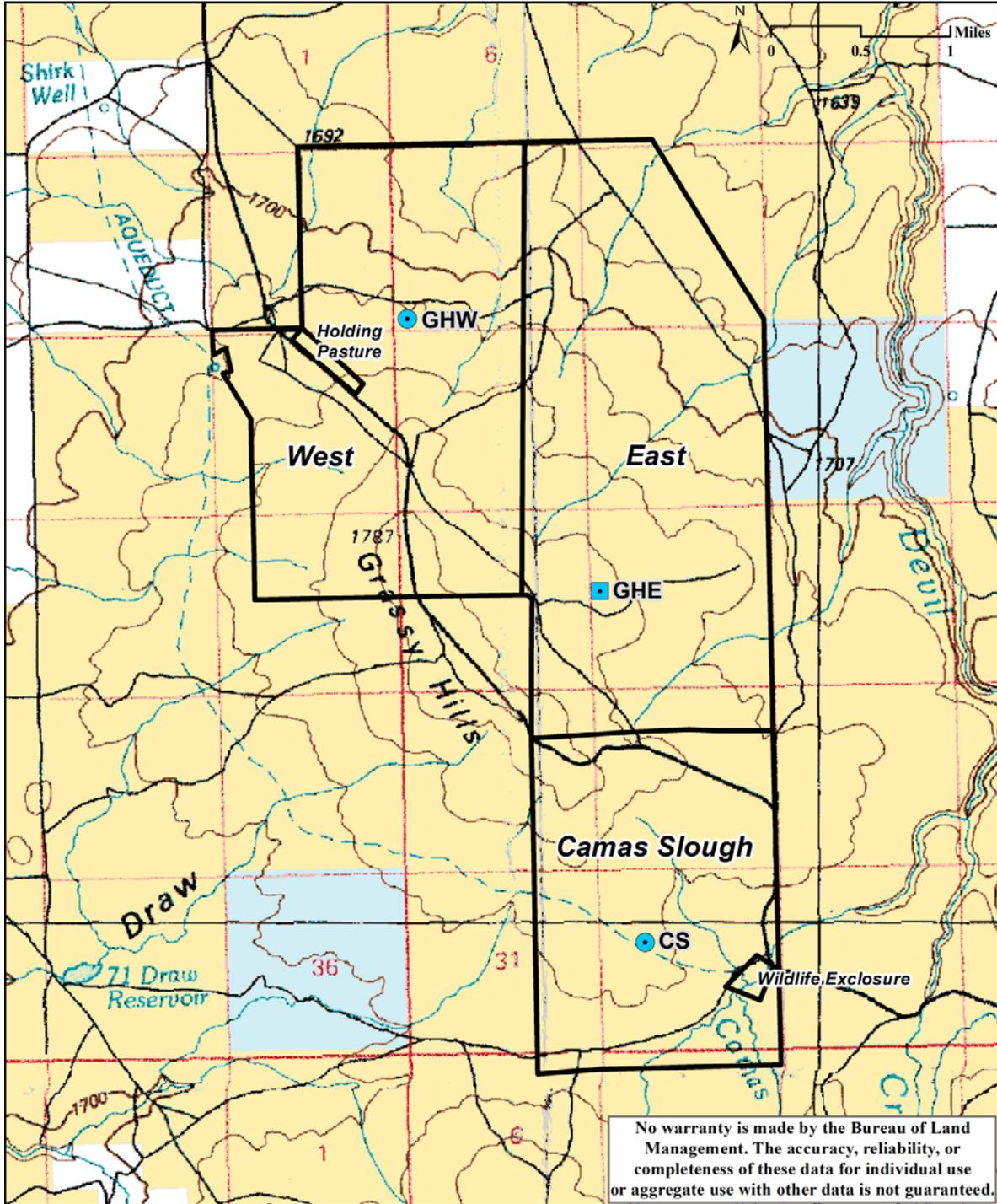


Table 16 shows indicator ratings for each site in the Camas Slough and Grassy Hills Allotments.

Table 16: Summary of 17 Rangeland Health Indicators

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

CS= Camas Slough Allotment and Grassy Hills Allotment, East Pasture
GHW = Grassy Hills Allotment, West Pasture

The IDT felt the Camas Slough Allotment was also representative of the East Pasture of the Grassy Hills Allotment; therefore, the East Pasture is not listed separately in Table 13.

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 8 identifies which indicators are related to each of the three attributes. The IDT derived the attribute departure ratings by considering the preponderance of evidence of the 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 17.

Table 17: 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					CS, GHW
Hydrologic Function					CS, GHW
Biotic Integrity					CS, GHW

CS= Camas Slough Allotment; GHW = Grassy Hills Allotment, West Pasture

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

Wildfire has affected the Camas Slough and Grassy Hills Allotments on numerous occasions since 1958. The fire frequency (Map 3; Table 9) shows the most recent fire activity.

Several soils series exist within the allotments. Soils are typically generally loamy with inclusions of stony loams and claypans. Claypan soils have a higher potential for run-off. The allotments are relatively flat with no slopes greater than 20 percent occurring within the allotments. Within the Camas Slough Allotment, 19 percent has a moderate wind erosion factor and the remaining 81 percent is located in the non-erosive erosion factor category. The majority of both allotments are gently sloping.

The Soil Survey Geographic (SSURGO) data base (NRCS 2012) shows the entire Camas Slough Allotment has a medium water erosion hazard. The SSURGO data base also indicates 89 percent of the Grassy Hills Allotment has a moderate wind erosion hazard and 11percent is within the non-erosive erosion factor category. 86 percent of the Grassy Hills Allotment has a medium water erosion hazard and 14 percent has a high water erosion hazard.

Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment

The site in the Camas Slough Allotment was evaluated using the ESD (R025XY010ID) reference sheet for the Claypan 12-16" low sagebrush/Idaho fescue ecological site (USDA NRCS, 2013a). The Claypan 12-16 ARAR8/FEID ESD reference sheet indicates bare ground should range from 40 – 50 percent, litter cover should be low and at a shallow depth but no values were listed and soil stability test value should range from 3 to 5 on a scale of 1 thru 6 (Pellant et al., 2005). The IDT felt the Camas Slough Allotment was also representative of the East Pasture of the Grassy Hills Allotment.

IIRH Site CS is located in the Camas Slough Allotment within an Idaho fescue community. Idaho fescue comprises 10.5 percent of cover, Sandberg bluegrass is 7.5 percent, bluebunch wheatgrass is 7.0 percent and western wheatgrass is 5.5 percent. The shrub component is yellow rabbitbrush and comprises 5.5 percent of cover.

During the 2013 IIRH evaluation, field notes indicated there were no pedestals, rills, water flow patterns, etc. observed. Bare ground was 24.5 percent, which is below the range listed in the ESD. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 3.5 (soil stability range should be 3 to 5), indicating resistance to erosion. A soil pit (Photo 5) dug at the site indicated a lack of a compaction layer and showed that plant roots were well distributed.

Litter was present at 33 percent (all layers) and was rated as slightly higher than what the ESD stated and therefore, the indicator for litter was rated as a slight to moderate departure from the reference condition.

All indicators related to the Soil and Site Stability attribute were rated none to slight. All indicators related to the Hydrologic Function attribute other than Litter Amount were rated none to slight. The overall rating for both Soil and Site Stability and Hydrologic Function was none to slight.

Photo 5: Soil Profile in the Camas Slough Allotment



West Pasture of the Grassy Hills Allotment

The West Pasture of the Grassy Hills Allotment site was evaluated with the ESD (R025XY024ID) reference sheet for the Loamy 12-16" Basin Big Sagebrush/Idaho fescue-bluebunch wheatgrass ecological site (USDA NRCS 2013b). The reference sheet for this ESD indicates bare ground should range from 20 – 40 percent for sites mid-seral status, litter cover should range from 5 – 10 percent and soil stability test values should range from 4 to 6 on a scale of 1 thru 6 (Pellant et al., 2005).

IIRH Site GHW is located in the West Pasture of the Grassy Hills Allotment within an Idaho fescue/bluebunch wheatgrass community. Bluebunch wheatgrass comprises 30.5 percent of cover, Sandberg bluegrass is 16.5 percent, crested wheatgrass is 16.0 percent and western wheatgrass is 5.0 percent. The shrub component is yellow rabbitbrush and comprises 0.5 percent of cover.

During the 2013 IIRH evaluation, field notes indicated that there was “past evidence of pedestals from fire.” Bare ground was 7.0 percent, which is lower than the range listed in the ESD. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 4.0 (soil stability range should be 4 to 6), indicating resistance to erosion. A soil pit (Photo 6) dug at the site indicated a lack of a compaction layer and showed that plant roots were well distributed.

Litter was present at 58.5 percent (all layers) and was rated as “moderately more” than expected and therefore, the indicator for litter was rated as a moderate to extreme departure from the reference condition.

All indicators related to the Soil and Site Stability attribute were rated none to slight. All indicators related to the Hydrologic Function attribute other than Litter Amount were rated none to slight. The overall rating for both Soil and Site Stability and Hydrologic Function was none to slight.

Photo 6: Soil Profile in the West Pasture of the Grassy Hills Allotment



Evaluation of Standard 1

Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment

During the 2013 IIRH evaluation at the Camas Slough Allotment site (which was also representative of the East Pasture of the Grassy Hills Allotment) there was no evidence of pedestals, rills, water flow patterns, etc. observed by the IDT, bare ground was 24.5 percent and soil stability value averaged 3.5, indicating resistance to erosion, with no compaction layer present. Litter was present at 33 percent (all layers) and was rated as slightly higher than what the ESD stated; therefore, the indicator for litter was rated as a slight to moderate departure from the reference condition.

IDT notes indicate that both yellow rabbitbrush and Wyoming big sagebrush are abundant, forbs are abundant and diverse and very few invasives were observed at the site. The notes also state

that all vegetative groups are present; therefore, the plant community composition and distribution relative to infiltration is appropriate for the site.

All indicators related to the Soil and Site Stability attribute were rated none to slight. All indicators related to the Hydrologic Function attribute other than Litter Amount were rated none to slight. The overall rating for both Soil and Site Stability and Hydrologic Function was none to slight.

West Pasture of the Grassy Hills Allotment

During the 2013 IIRH evaluation in the West Pasture of the Grassy Hills Allotment, field notes indicated that there was “past evidence of pedestals from fire” but there was no evidence of rills, water flow patterns, litter movement, etc. observed by the IDT, bare ground was 7.0 percent and soil stability value averaged 4.0, indicating resistance to erosion, with no compaction layer present. Litter was present at 58.5 percent (all layers) and was noted as being “moderately more” than expected; therefore, the indicator for litter was rated as a moderate to extreme departure from the reference condition.

IDT notes indicate that yellow rabbitbrush was present but not abundant, forbs are abundant and diverse and very few invasives were observed at the site. The notes also even though shrubs are generally lacking, the component of yellow rabbitbrush present, as well as perennial deep-rooted bunchgrasses, are sufficient for plant community composition and distribution relative to infiltration.

All indicators related to the Soil and Site Stability attribute were rated none to slight. All indicators related to the Hydrologic Function attribute other than Litter Amount were rated none to slight. The overall rating for both Soil and Site Stability and Hydrologic Function was none to slight.

Evaluation Finding – Camas Slough and Grassy Hills Allotments are:

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

Rationale for Evaluation Finding

At both sites evaluated, there is a component of biotic crust and litter present and both provide protection to the soil surface from erosion; in addition, the topography is relatively flat, reducing the risk for accelerated soil erosion. The soil stability test results (3.5 and 4.0) also indicated resistance to erosion. Invasives were noted as being “very few” at both sites. There was no evidence of rills, water flow patterns, litter movement, etc. noted by the IDT. Pedestals were not observed within the Camas Slough Allotment site and in the West Pasture of the Grassy Hills Allotment were noted as “past evidence of pedestals from fire.”

Deep-rooted perennial bunchgrasses and shallow-rooted grasses are both present within the plant communities and are as expected for areas that have burned by wildfire multiple times and have been reseeded and/or allowed to recover naturally. The 2012 HAF data indicates that percent cover of perennial grass species varied across the two sites (Table 17) but the species present are

appropriately productive, are capable of reproduction and are providing soil cover and competition to invasive species.

Historically, wildfire has affected the Camas Slough and Grassy Hills Allotments and due to recurring wildfire, shrub cover is reduced. According to aerial photos and GIS mapping, approximately 14 acres of concentrated Wyoming sagebrush remains within the Camas Slough Allotment, along with a few very small pockets of low sagebrush scattered throughout the allotment. Some young sagebrush and rabbitbrush was observed throughout both sites evaluated, indicating continued reproduction and although shrubs were reduced, soil moisture was adequate for herbaceous plant growth and reproduction. Deep-rooted perennial bunchgrasses can help support nutrient cycling and energy flow due to their above and below ground structure. Shallow-rooted grasses generally have a shorter active growth period, smaller root systems and relatively lower potential to capture and store carbon below ground

For both sites evaluated, the overall rating for both the Soil and Site Stability and Hydrologic Function attributes were rated as none to slight departure from the reference condition.

The combination of the lack of rills, gullies, flow patterns, etc., the presence of stable soils, the presence of a shrub component, in conjunction with the overall presence of large statured, deep rooted perennial bunchgrasses and the low percent of cheatgrass present all allow the vegetative communities within the four pastures to function to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow and the hydrologic cycle. Therefore, the Camas Slough Allotment and the East and West Pastures of the Grassy Hills Allotment are meeting Standard 1.

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

Rangeland Health Assessment

No perennial streams exist within the Camas Slough and Grassy Hills Allotments. The National Hydrography Dataset (NHD) (USGS 2014) lists streams within these allotments as being intermittent, but most of the streams are ephemeral. The NHD does not differentiate between ephemeral and intermittent streams. Ephemeral streams only flow in direct response to precipitation and are above the water table throughout the year (BLM, 1998). No lotic (flowing water) evaluations have been completed within the allotments due to the lack of flowing water from early summer through winter. Intermittent streams only have water during the spring snow melt or receive water from springs which dry up later in the year. Camas Slough is the only intermittent stream present within the Camas Slough Allotment and does not extend into the Grassy Hills Allotment.

Camas Slough Allotment

Exclosure

Based on the 2011 NAIP imagery, there is one semi-wet meadow (Camas Slough) of approximately 73 acres within the Camas Slough Allotment. A portion of the meadow is a naturally occurring wetland. Therefore, Standard 2 applies to the Camas Slough Allotment. A low earthen dam was constructed in 1948 to retain water for livestock management. In 1990, the earthen dam was reconstructed, three nesting islands were created, and a protection fence was constructed to improve the wetland and wildlife habitat (Photo 7). Approximately 21 acres of the wetland are fenced to exclude livestock during the spring and early summer to protect nesting waterfowl and shorebirds. During most years, water extends upstream past the protection fence by 0.1 to 0.2 miles. The southwestern exclosure fence crosses open water in the spring and is a potential collision hazard for waterfowl and shorebirds.

Photo 7: Camas Slough, nesting islands and protection fence



The Camas Slough wetland provides habitat for a variety of wildlife. Chorus frogs (*Pseudaris triseriata*) were documented during night surveys in 2006 and 2007 but no other amphibians were detected. Camas Slough provides habitat during spring migration for a variety of shorebirds such as yellow legs (*Tringa* spp.), willet (*Catoptrophorus semipalmatus*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra Americana*), phalaropes (*Phalaropus* spp.), as well as waterfowl species such as pintail (*Anus acuta*), canvasback (*Aythya valisineria*), Northern shoveler (*Anus clypeata*), ring-necked duck (*Aythya collaris*), bufflehead

(*Bucephala albeola*), and Canada geese (*Branta canadensis*). Most years, mallard (*Anus platyrhychos*), cinnamon teal (*Anus cynnoptera*), Canada geese and killdeer (*Charadrius vociferus*), red-winged blackbird (*Aegaius phoeniceus*) and common snipe (*Gallinago gallinago*) nest at Camas Slough. The wetland also serves as a water source for big game species during the spring and early summer.

In 2007, the functional condition of the Camas Slough wetland within the wildlife enclosure was evaluated using the current BLM wetland assessment protocol (BLM, 2003). The results of the assessment are displayed in Table 16. The protocol is a broad-scale assessment that uses hydrology, vegetation, and erosion/deposition (soil) attributes and processes to qualitatively assess the condition of wetland areas. The assessments determinations include ratings of Proper Functioning Condition (PFC), functioning at risk with an upward trend (FAR-UP), functioning at risk with no apparent trend (FAR-NA), functioning at risk with a downward trend (FAR-DN), and non-functioning (NF). The evaluation determined the Camas Slough wetland within the enclosure was functioning properly. The assessment noted some of the big sagebrush formerly in the back waters of the wet meadow died because of saturated soil conditions. Mountain rush (*Juncus arcticus*), which is also known as Baltic rush and spikerush (*Eleocharis* spp.) are present and expanding, replacing Kentucky bluegrass.

Two small stock ponds are located upstream (south) of the Camas Slough Allotment which retains water in the Camas Slough drainage. Although these ponds are located outside of the allotment, they influence the hydrology within the Camas Slough Allotment. Wetland vegetation is limited along most of the Camas Slough drainage and generally concentrated near the ponds and low areas where water persists longer in the year. The species present in the Camas Slough drainage, such as Mountain rush, are tolerant of relatively long periods with limited moisture.

Designated Monitoring Area (DMA)

A riparian DMA was established upstream of the Camas Slough wetland as a result of the interim grazing measures in the 2005 SSA (as modified on January 20, 2011), which was determined to be representative of the entire reach. The riparian condition within the DMA was assessed using Multiple Indicator Monitoring (MIM) protocols as described in BLM Technical Reference 1737-23 (2011), which defines the MIM protocol as being “developed and tested on relatively low gradient (less than 4 percent), perennial snowmelt –dominated and spring-fed streams in the Western United States and is most applicable to those systems. Streamside riparian and wetland vegetation is a critical component within those systems for stabilizing physical stream processes and functions that influence streambank stability and channel geometry.”

The protocol identifies 10 indicators for assessing stream channel conditions, including 7 long-term indicators and 3 short-term (annual), which are stubble height, streambank alteration and woody species use. The intermittent stream that drains into the Camas Slough wetland does not have sufficient flows to develop a floodplain and create a greenline. Based on the channel features and vegetation at the DMA, this is an intermittent stream which supports wetland plants that tolerate drier conditions and are able to stabilize the channel during peak flows. From a hydrologic standpoint, this stream functions more like a wetland than a stream. Therefore, many

of the stream channel indicators in the MIM do not apply to this stream. The annual indicator for stubble height on key hydric plant species is the most applicable indicator for the DMA.

The DMA was established on July 22, 2011 (Photo 8) and the initial vegetation assessment determined the key hydric plant species for stubble height measurements is mountain rush (*Juncus arcticus*). Stubble height criteria for a non-fish bearing streams is a 4 inch minimum stubble height post-grazing. Woody riparian species, such as willow and dogwood, are not present within the DMA, so measurements of woody browse utilization were not taken. Vegetation along the DMA consists of a mixture of upland and wetland species with much of the streambed being completely covered with perennial vegetation such as mountain rush, meadow barley and Kentucky bluegrass, western wheatgrass and Wyoming big sagebrush. Comments from the IDT noted “the reach is dry...perennial vegetation is dominant throughout entire width of reach at several locations.”

Photo 8: Camas Slough DMA – July 22, 2011



The utilization data collect in 2012 showed stubble height on *Juncus* spp. as 4.7 inches and 5.12 inches on western wheatgrass (Photo 9). In addition, little to no surface water was present within the DMA and upland species, such as sage brush seedlings, were observed growing in the stream bed.

Photo 9: Camas Slough DMA, November 8, 2012



The utilization data collected in 2013 showed stubble height on *Juncus* spp. as 3.28 inches and 1.96 inches on Kentucky bluegrass (Photo 10). In addition, 2013 had a drier than normal weather pattern and little to no surface water within the DMA. Although the stubble height standard of 4.0 inches was exceeded, this was addressed through the compliance process with the permittee.

Photo 10: Camas Slough DMA – September 4, 2013



The DMA will not be evaluated for Standard 2 because the site was not an appropriate location to apply MIM protocol.

Grassy Hills Allotment

Several small man-made reservoirs occur within the Grassy Hills Allotment - three in the West Pasture and two in the East Pasture. The drainages where the ponds are located only have water for a period of time in the spring and lack riparian vegetation. These reservoirs were not evaluated due to their artificial nature.

No wetlands are present in the West Pasture of the Grassy Hills Allotment.

Two small (approximately 1 acre) and one larger (7 acres) upland intermittent wetlands are present in the East Pasture of the Grassy Hills Allotment. One of the livestock ponds is located within 0.2 miles of the largest wetland. All the wetlands contain mountain rush and other grasses such as Kentucky bluegrass, meadow foxtail (*Hordeum brachyantherum*) and bentgrass (*Agrostis* spp.); in addition, Canada thistle (*Cirsium arvense*) has been observed.

Livestock in the West Pasture are excluded from wetlands associated with Shirk Reservoir by a barbed wire fence. Water is maintained in Shirk Reservoir throughout the summer by the House

Creek pipeline system. Chorus frogs (*Pseudaris triseriata*) were noted as being present in this three acre reservoir in 2007.

The wetlands within the East Pasture of Grassy Hills Allotment have not been formally assessed using the current BLM protocol; therefore, they cannot be evaluated at this time.

Evaluation of Standard 2

Camas Slough Allotment:

The functional condition of the Camas Slough wetland within the wildlife enclosure was evaluated in 2007 using the BLM’s current protocol for assessing wetlands (BLM, 2003). The evaluation rated the wetland as in proper functioning condition and the attributes are displayed in Table 18.

Table 18: Evaluation of Attributes for the Camas Slough Wetland in the Enclosure

Attribute from Evaluation Form	Yes	No	N/A
Riparian-wetland areas is saturated at or near the surface or inundated in “relatively frequent” events (1)	X		
Fluctuation of water levels is not excessive (2)	X		
Riparian-wetland zone is enlarging or has achieved potential extent (3)	X		
Upland watershed is not contributing to riparian-wetland degradation (4)	X		
Water quality is sufficient to support riparian-wetland plants (5)	X		
Natural surface or subsurface flow patterns are not altered by disturbance (i.e. hoof action, dam, trails, roads, rills, gullies, drilling activities) (6)	X		
Structure accommodates safe passage of flows (e.g. no headcut affecting dam or spillway) (7)	X		
There is a diverse age-class distribution or riparian –wetland vegetation (recruitment for maintenance/recovery) (8)	X		
There is a diverse composition of riparian-wetland vegetation (for maintenance/recovery) (9)	X		
Species present indicate maintenance of riparian-wetland soil moisture characteristics (10)	X		
Vegetation is comprised of those plants or plant communities that have root masses capable of withstanding wind events, wave flow events, or overland flows (e.g. storm events, snowmelt) (11)	X		
Riparian-wetland plants exhibit high vigor (12)	X		
Adequate vegetative cover present to protect shorelines/soil surface and dissipate energy during high wind and wave events or overland flows (13)	X		
Frost or abnormal hydrologic heaving is not present (14)			X
Favorable microsite conditions (i.e., woody debris, water temperature, etc.) is maintained by adjacent site characteristics (15)			X
Accumulation of chemicals affecting plant productivity/composition is not apparent (16)	X		
Saturation of soils (i.e. ponding, flooding frequency and duration) is sufficient to compose and maintain hydric soils (17)	X		
Underlying geologic structure/soil material/permafrost is capable of restricting water percolation (18)	X		
Riparian-wetland is in balance with water and sediment being supplied by the	X		

Attribute from Evaluation Form	Yes	No	N/A
watershed (i.e. no excessive erosion or deposition) (19)			
Islands and shoreline characteristics (i.e. rocks, course and or large woody debris) adequate to dissipate wind and wave event energies (20)	X		

All items from the 2007 evaluation applicable to the Camas Slough wetland within the enclosure were marked “yes”, indicating the attributes or processes are functioning appropriately. Wetland vegetation age class and structure are appropriate for the site. Vegetation is sufficient to prevent erosion and maintain hydric soils conditions. The wetland is in balance with water and sediment supply. Vegetation at the Camas Slough wetland is dominated by grasses (Kentucky bluegrass, meadow barley, etc.) and grasslike plants (rushes and spikerush). It should be noted Item 6 on the data sheet was marked as “yes” although there is a dam that alters the natural surface and/or subsurface flow patterns for the wetland (e.g., retains water). The dam allows some spring run-off to pass and seepage from the reservoir helps maintain wetlands downstream.

Outside and up gradient of the Camas Slough enclosure two drainages contribute run-off during the spring. In years with more moisture, late spring/early summer livestock grazing leads to bank alteration and pugging or hummocking of the wetland because soils are saturated. In years with low precipitation and minimal run-off, early summer grazing has less trampling impact because the soils are drier. By late summer and fall the soils have dried and there is negligible trampling impact on the wetland soils. The location of the water trough exacerbates livestock use of wetland vegetation outside the enclosure irrespective of the time of year.

Evaluation Finding – Camas Slough Allotment is:

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

Rationale for Evaluation Finding

The Camas Slough wetland within the enclosure is functioning properly. Age class and structural diversity of the wetland plants are appropriate for the site. Sufficient deep-rooted vegetation (mountain rush, spikerush and other graminoids) exists to stabilize shorelines from wind and wave energy. Canada thistle was observed but was not noted as increasing. The functional condition of the Camas Slough wetland within the wildlife enclosure was evaluated in 2007 using the BLM’s current protocol for assessing wetlands (BLM, 2003). The assessment rated the wetland as proper functioning condition; therefore, the Camas Slough wetland is meeting Standard 2.

Grassy Hills Allotment:

Evaluation Finding - Grassy Hills Allotment

- Standard Doesn’t Apply

Rationale for Evaluation Finding

Several small man-made reservoirs occur within the Grassy Hills Allotment - three in the West Pasture and two in the East Pasture. The drainages where the ponds are located only have water for a period of time in the spring and lack riparian vegetation. These reservoirs were not

evaluated due to their artificial nature. Three upland intermittent wetlands are present in the East Pasture of the Grassy Hills Allotment. However, these wetlands have not been assessed using the BLM wetland assessment protocol (BLM 2003) and cannot be evaluated in this determination. No wetlands are present in the Grassy Hills Allotment; therefore, Standard 2 does not apply.

Standard 3 (Stream Channel/Floodplain)

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

 X Standard Doesn't Apply

The streams within the Camas Slough and Grassy Hills Allotments are ephemeral or intermittent. Ephemeral streams only flow in direct response to precipitation and are above the water table throughout the year (BLM, 1998). Although stream flow in the ephemeral drainages can develop some channel sinuosity and move sediment, flows do not persist long enough to support riparian wetland obligate plant species. This is an altered system, with two small stock ponds located upstream (south) of the Camas Slough Allotment which retains water in the Camas Slough drainage. Although these ponds are located outside of the allotment, they influence the hydrology within the Camas Slough Allotment.

Because stream channels with floodplains are not present within the Camas Slough and Grassy Hills Allotments, Standard 3 does not apply.

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

Standard 4 applies to the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment. The evaluation for the Camas Slough and the East Pasture of the Grassy Hills Allotment was based on a randomly located sage-grouse habitat assessment (HAF) site within the Camas Slough Allotment. The IDT agreed that the Camas Slough HAF site was representative of the entire Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment after evaluating the proposed sites while in the field. The two pastures are similar in that neither have been drill seeded, are dominated by perennial native grasses and have a shrub component that is recovering due to aerial seeding of sagebrush following wildfire.

Indicators for Rangeland Health (IIRH) were assessed at one location (CS), which is a HAF site. Vegetative cover data was collected at the HAF site in 2012 (Photo 11) and that cover data is summarized in Table 19. Vegetative cover data was collected at multiple layers (Cooperative Extension Service et al., 1999); however, Table 17 displays only the top cover layer to allow comparison of cover data to ESD reference sheet values.

Both allotments have been burned in wildfire multiple times over the last 20 years, most recently in the 2007 Murphy Complex Fire. As a result of wildfire and subsequent rehabilitation efforts, plant communities within the allotment have been modified from their native state; in the case of the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment, the main modification has been to the shrub component, which has been significantly reduced.

Table 19: IIRH Site - Percent Vegetative Cover Data (Top Layer Only)

Vegetation Class	Species	Camas Slough CS (HAF) (2012)
Perennial Grasses	Sandberg bluegrass	7.5%
	Crested wheatgrass	0.0%
	Bluebunch wheatgrass	7.0%
	Western wheatgrass	5.5%
	Idaho fescue	10.5%
	Squirreltail	0.5%
	Thurber's needlegrass	0.5%
Annual Grasses	Cheatgrass	0.5%
Perennial Forbs	Desert parsley	0.0%
	Long-leaf phlox	10.0%
Annual Forbs	Yellow salsify	0.5%
Shrubs	Yellow rabbitbrush	5.5%
Vegetation Total		48.0%
Other Cover	Biotic Crust	2.0%
	Bare Ground	24.5%
	Litter in contact with soil	7.0%
	Litter standing	16.0%
	Rock/Gravel	2.5%
Total		100.0%

Photo 11: HAF Site CS - June 12, 2012



Table 20: Additional Vegetative Cover Data (Top Layer Only)

Vegetation Class	Species	Camas Slough			Grassy Hills (East Pasture)
		RA-104a (ESI) (2006)	CSC-1 (2003)	CSC-2 (2003)	GHE (HAF) (2013)
Perennial Grasses	Sandberg bluegrass	10.0%	19.0%	15.0%	7.0%
	Bluebunch wheatgrass	4.7%	6.0%	6.0%	48.0%
	Idaho fescue	34.0%	6.0%	6.0%	7.0%
	Crested wheatgrass	0.0%	0.0%	0.0%	0.0%
	Squirreltail	2.7%	0.0%	0.0%	0.0%
	Basin wildrye	0.0%	0.0%	1.0%	0.0%
	Thurber's needlegrass	0.0%	21.0%	6.0%	0.0%
Intermediate wheatgrass	0.0%	0.0%	0.0%	0.0%	
Annual Grasses	Cheatgrass	0.0%	0.0%	2.0%	0.0%
Perennial Forbs	Lupine	0.7%	1.0%	3.0%	0.0%
	Desert parsley	0.0%	0.0%	0.0%	1.0%
	Longleaf phlox	0.0%	0.0%	3.0%	0.0%
	Western stoneseed	0.0%	0.0%	3.0%	0.0%
	Lambstongue ragwort	0.0%	0.0%	1.0%	0.0%

Vegetation Class	Species	Camas Slough			Grassy Hills (East Pasture)
		RA-104a (ESI) (2006)	CSC-1 (2003)	CSC-2 (2003)	GHE (HAF) (2013)
	Pale agoseris	0.0%	1.0%	0.0%	0.0%
Annual Forbs	Maiden blue eyed Mary	0.0%	9.0%	4.0%	0.0%
	Epilobium	1.3%	0.0%	0.0%	0.0%
Shrubs	Low sagebrush	1.3%	0.0%	0.0%	0.0%
	Yellow Rabbitbrush	2.7%	1.0%	10.0%	0.0%
	Wyoming big sagebrush	2.0%	5.0%	14.0%	0.0%
Vegetation Total		59.4%	69.0%	74.0%	63.0%
Other Cover	Bare Ground	12.7%	7.0%	5.0%	6.0%
	Biotic Crust	0.7%	11.0%	2.0%	16.0%
	Litter in contact with soil	13.3%	4.0%	1.0%	12.0%
	Litter standing	4.7%	2.0%	10.0%	2.0%
	Rock	9.3%	7.0%	8.0%	1.0%
Total		100.0%	100.0%	100.0%	100.0%

Photos 12 and 13 were taken at utilization site CASL_2 (Map 2) in 2011 and 2012. These photos show a shrub component consisting of both yellow rabbitbrush and sagebrush that is present within the Camas Slough Allotment.

Photo 12: Utilization Site CASL_2 – September 14, 2011



Photo 13: Utilization Site CASL_2 – July 25, 2012



Camas Slough Allotment

IIRH Site CS (Photo 14) is located in the Camas Slough Allotment. The 2012 HAF data showed Idaho fescue was the dominant perennial bunchgrass recorded at 10.5 percent cover, Sandberg bluegrass was 7.5 percent cover, bluebunch wheatgrass was 7.5 percent cover and western wheatgrass was 5.5 percent cover. Wyoming big sage was not recorded at the site but yellow rabbitbrush was recorded as 5.5 percent cover. Long leaf phlox, a perennial forb, was recorded as 10 percent cover. Biotic crust was recorded as 2 percent cover and bare ground as 24.5 percent cover. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 3.5 (based on a range of 3 to 5; Pellant et al., 2005), indicating appropriate resistance to erosion.

In the 2013 IIRH evaluation, it was noted that “both yellow rabbitbrush and Wyoming big sagebrush were abundant and forbs are abundant and diverse”; therefore, the functional/structural group indicator was rated as a none to slight departure from the reference condition.

The 2012 cover data showed litter at 33 percent cover (all layers), which is slightly higher than the ESD; therefore, the litter amount indicator was rated as a slight to moderate departure from the reference condition.

Cheatgrass was recorded at 0.5 percent and “very little invasives” were noted to be present; therefore, the indicator for invasive plants was rated as a none to slight departure from reference condition.

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

Photo 14: HAF Site CS - Photo taken July 24, 2013



Grassy Hills Allotment – East Pasture

Evaluation Site GHE - Loamy 12-16”

HAF data was collected at the GHE site on June 26, 2013. Bluebunch wheatgrass was recorded at 48 percent of cover and both Sandberg bluegrass and Idaho fescue were each recorded at 7 percent cover. No shrubs were recorded at the site, desert parsley, a perennial forb, was recorded as 1 percent cover, biotic crust as 16 percent cover and bare ground as 6 percent cover. No IIRH indicators were read at the GHE site due to the IDT determination that the Camas Slough (CS) site was also representative of the East Pasture of the Grassy Hills Allotment.

Evaluation of Standard 4

Wildfire has occurred in the Camas Slough and the East Pasture of the Grassy Hills Allotment over the last 20 years, most recently in the 2007 Murphy Complex Fire. As a result of wildfire and subsequent rehabilitation efforts, plant communities within the allotment have been modified from their native state; in the case of the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment, the main modification has been to the shrub component.

The 2012 HAF data showed Idaho fescue was the dominant perennial bunchgrass recorded at 10.5 percent cover, Sandberg bluegrass was 7.5 percent cover, bluebunch wheatgrass was 7.5 percent cover and western wheatgrass was 5.5 percent cover. Wyoming big sage was not recorded at the site but yellow rabbitbrush was recorded as 5.5 percent cover. Long leaf phlox, a perennial forb, was recorded as 10 percent cover. Biotic crust as 2 percent cover and bare ground as 24.5 percent cover. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 3.5, indicating resistance to erosion.

During the 2013 IIRH evaluation, the IDT rated the functional/structural group indicator at a none to slight departure for IIRH site CS. This rating was based on field observations documenting the presence of deep-rooted perennial bunchgrasses, shallow rooted grasses and perennial forbs. Deep-rooted perennial bunchgrasses can help support nutrient cycling and energy flow due to their above and below ground structure. Shallow-rooted grasses generally have a shorter active growth period, smaller root systems, and relatively lower potential to capture and store carbon below ground. The perennial species present within the seeded areas are appropriately productive and are capable of reproduction and recruitment of new seedlings and are providing soil cover and competition to invasive species.

Cheatgrass was recorded at 0.5 percent and the 2012 IIRH field notes also stated that “very little invasives” were noted to be present; therefore, the indicator for invasive plants was rated as a none to slight departure from reference condition.

The overall rating for the Biotic Integrity attribute was rated as a none to slight departure from the reference condition for the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment.

Trend data shows the frequency of Sandberg bluegrass has increased from 95 occurrences in 1991 to 99 occurrences in 1998 to 100 occurrences in 2012. Idaho fescue has increased from 65 occurrences in 1991 to 92 occurrences in 1998 and then decreased to 70 occurrences in 2012. Bluebunch wheatgrass increased from 24 occurrences in 1991 to 25 occurrences in 1998 to 52 occurrences in 2012. Although the site burned in the 2007 Murphy Complex Fire, the perennial bunchgrasses did not decline significantly but wildfire killed the majority of sagebrush. Perennial and annual forbs have increased from 69 occurrences in 2000 to 117 occurrences in 1998 and decreased to 107 occurrences in 2012. While the total forb occurrences have likely increased, this may also be due to the timing of data collection, precipitation and temperature.

This site burned in the 2007 Murphy Complex and was subsequently aerially seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2012 data to the 1991 and 1998 data would not be appropriate as a basis to support conclusions of overall trend. The first

reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2012 trend reading is discussed to show the general recovery and current baseline of the site.

Evaluation Finding – Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment are:

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

Rationale for Evaluation Finding

The sites evaluated in the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotments contained adequate diversity of species, with an abundance of deep-rooted perennial bunchgrasses present, along with perennial forbs present as a minor component. Deep-rooted perennial bunchgrasses help support nutrient cycling and energy flow due to their above and below ground structure, with a large root system to stabilize soils, facilitate soil moisture percolation and provide a high potential to capture and store carbon below ground. The perennial species present within the pastures are appropriately productive and are capable of reproduction and recruitment of new seedlings.

Adequate litter is present within the sites to provide cover for site protection and replenishing nutrients. Soils were stable with no signs of rills, flow patterns and other signs of active erosion.

No noxious weeds were noted in the uplands of either allotment and cheatgrass was not recorded at the site evaluated; in addition, desirable perennial plants were adequate to hinder the establishment and spread of invasive plants.

Wyoming big sagebrush was not observed at the sites and yellow rabbitbrush was recorded as being present as 5.5 percent cover. Rabbitbrush was noted to be present in both pastures but are generally small (< 20 acres) and density is sparse. Rabbitbrush was generally less abundant in Grassy Hills than Camas Slough. Rehabilitation efforts have been undertaken to reseed Wyoming big sagebrush following several wildfires, the most recent after the 2007 Murphy Complex Fire. The lack of shrub cover is apparent in the pasture but seedlings were noted to be present. Shrubs function to catch snow and thereby increase infiltration and sagebrush roots can redistribute small amounts (less than 0.3 inches) of water in the soil profile up to 1.5 meters in depth (Ryel et al., 2003). The limited amount of shrubs can influence the ecological structural and functional groups to some degree. Hydrologically, the amount of deep rooted perennial grass partially compensates for reduced shrubs with respect of holding snow on site and allowing infiltration. Water infiltration and retention was functioning as evidenced by plant growth and reproduction.

The IDT discussed the present vegetation community at length and felt that because all the functional/structural groups were present and relatively well represented, Standard 4 was being met considering the time since the allotment burned. The IDT noted that rabbitbrush is present in patches and as individuals. In addition, Wyoming big and low sagebrush is returning due to aerial seeding efforts post-fire and sagebrush seedling plantings. The IDT also agreed the

allotment was not at the desired state, compared to the potential natural community, primarily due to less shrub height and cover than would be expected had the site not burned (IDT Considerations for Meeting Standard 4, Haney, Hilty and Klott, 2015).

Even with shrubs occurring as a minor component, the native vegetation communities within the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment have sufficient vegetation structure to resist the loss of biotic integrity and to recover following disturbances. The combination of the presence of large statured, deep rooted perennial bunchgrasses, shallow rooted, perennial grasses and perennial forb species all allows the native vegetation communities to function to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle. Therefore, the Camas Slough Allotment and the East Pasture of the Grassy Hills Allotment is meeting Standard 4.

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

Rangeland Health Assessment

Standard 5 applies to the West Pasture of the Grassy Hills Allotment. Portions of this pasture have burned multiple times since the 1960s and most recently in the 2007 Murphy Complex Fire. As a result of wildfires and subsequent rehabilitation efforts, plant communities within this pasture have been modified from their native state. Following some of the fires, parts of the pasture were drilled seeded to crested wheatgrass and more recently, seeded with bluebunch wheatgrass. This pasture was not drill seeded following the 2012 Murphy Complex Fire because previous treatments have occurred in this pasture. HAF site GHW was assessed using the IIRH protocols specifically to apply Standard 5 because a large portion of the pasture has been drilled seeded.

Table 21: IIRH Site - Percent Vegetative Cover Data (Top Layer Only)

Vegetation Class	Species	Camas Slough CS (HAF) (2012)
Perennial Grasses	Sandberg's bluegrass	16.5%
	Crested wheatgrass	16.0%
	Bluebunch wheatgrass	30.5%
	Western wheatgrass	5.0%
	Idaho fescue	0.0%
	Basin wildrye	0.0%
	Bottlebrush squirreltail	0.0%
Annual Grasses	Cheatgrass	0.0%
Perennial Forbs	Desert parsley	0.0%
	Lupine	0.0%
	Long-leaf phlox	3.5%
Annual Forbs	Epilobium	0.0%
Shrubs	Yellow rabbitbrush	0.5%
Vegetation Total		72.0%
Other Cover	Biotic Crust	0.5%
	Bare Ground	7.0%
	Litter in contact with soil	10.5%
	Litter standing	10.0%
	Rock/Gravel	0.0%
Total		100.0%

Table 22: Additional Vegetative Cover Data (Top Layer Only)

Vegetation Class	Species	Grassy Hills (West Pasture)	
		ESI Site RA-95a (2006)	ESI Site RA-99a (2006)
Perennial Grasses	Sandberg bluegrass	15.3%	4.7%
	Crested wheatgrass	0.0%	8.7%
	Bluebunch wheatgrass	16.7%	35.3%
	Western wheatgrass	0.0%	0.0%
	Idaho fescue	14.0%	0.7%
	Basin wildrye	0.0%	3.3%
	Intermediate wheatgrass	1.3%	0.0%
	Squirreltail	3.3%	1.3%
Annual Grasses	Cheatgrass	1.3%	2.0%
Perennial Forbs	Desert parsley	0.0%	1.0%
	Pale agoseris	0.7%	0.0%
	Lupine	0.0%	0.7%
	Long-leaf phlox	2.7%	0.0%
Annual Forbs	Epilobium	4.0%	1.3%
Shrubs	Yellow rabbitbrush	0.7%	2.0%
Vegetation Total		60.0%	59.3%
Other Cover	Biotic Crust	3.3%	0.7%

Vegetation Class	Species	Grassy Hills (West Pasture)	
		ESI Site RA-95a (2006)	ESI Site RA-99a (2006)
	Bare Ground	1.3%	5.3%
	Litter in contact with soil	14.7%	20.7%
	Litter standing	15.3%	11.3%
	Rock/Gravel	5.3%	2.0%
Total		100.0%	100.0%

Grassy Hills Allotment - West Pasture

Evaluation Site GHW - Loamy 12-16”

IIRH Site GHW (Photo 15) is located in the West Pasture of the Grassy Hills Allotment. The 2012 HAF data showed bluebunch wheatgrass was the dominant perennial bunchgrass recorded at 30.5 percent cover, Sandberg bluegrass was 16.5 percent cover, crested wheatgrass was 16 percent cover and western wheatgrass was 5 percent cover. Wyoming big sage was not recorded at the site and yellow rabbitbrush was recorded as 0.5 percent cover. Long leaf phlox, a perennial forb, was recorded as 3.5 percent cover. Biotic crust was recorded as 0.5 percent cover and bare ground as 7.0 percent cover. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 4 (based on a range of 4 to 6; Pellant et al., 2005), indicating appropriate resistance to erosion.

In the 2013 IIRH evaluation, it was noted that “yellow rabbitbrush was present but not in great abundance and forbs are abundant and diverse”; therefore, the functional/structural group indicator was rated as a slight to moderate departure from the reference condition.

The 2012 cover data showed litter at 58.5 percent cover (all layers), which is moderately higher than expected per the ESD; therefore, the litter amount indicator was rated as a moderate to extreme departure from the reference condition.

Cheatgrass was recorded at 0 percent and “very few invasives” were noted to be present; therefore, the indicator for invasive plants was rated as a none to slight departure from reference condition.

All indicators related to the Biotic Integrity attribute other than Functional/Structural Groups and Litter Amount were rated none to slight. The overall Biotic Integrity attribute was rated as a none to slight departure from the reference condition.

Photo 15: HAF Site GHW - Photo taken July 24, 2013



Evaluation of Standard 5

Wildfire has occurred in the West Pasture of the Grassy Hills Allotment over the last 20 years, most recently in the 2007 Murphy Complex Fire. As a result of wildfire and subsequent rehabilitation efforts, plant communities within the allotment have been modified from their native state.

The 2012 HAF data showed bluebunch wheatgrass was the dominant perennial bunchgrass recorded at 30.5 percent cover, Sandberg bluegrass was 16.5 percent cover, crested wheatgrass was 16 percent cover and western wheatgrass was 5 percent cover. Wyoming big sage was not recorded at the site and yellow rabbitbrush was recorded as 0.5 percent cover. Long leaf phlox, a perennial forb, was recorded as 3.5 percent cover. Biotic crust was recorded as 0.5 percent cover and bare ground as 7.0 percent cover. A soil stability test was completed at the site during the IIRH evaluation and the soil stability value averaged 4 (based on a range of 4 to 6; Pellant et al., 2005), indicating appropriate resistance to erosion.

In the 2013 IIRH evaluation, it was noted that “yellow rabbitbrush was present but not in great abundance and forbs are abundant and diverse”; therefore, the functional/structural group indicator was rated as a slight to moderate departure from the reference condition.

Cheatgrass was recorded at 0 percent and “very few invasives” were noted to be present; therefore, the indicator for invasive plants was rated as a none to slight departure from reference condition.

All indicators related to the Biotic Integrity attribute other than Functional/Structural Groups and Litter Amount were rated none to slight. The overall Biotic Integrity attribute was rated as a none to slight departure from the reference condition.

Trend data shows the frequency of bluebunch wheatgrass decreased from 77 occurrences in 2000 to 74 occurrences in 2012. Sandberg bluegrass has increased from 7 occurrences in 2000 to 46 occurrences in 2012. Although the site burned in the 2007 Murphy Complex Fire, bluebunch wheatgrass did not decline significantly but wildfire killed the majority of sagebrush. Perennial and annual forbs have increased from 93 occurrences in 2000 to 256 occurrences in 2012. While the total forb occurrences have likely increased, this may also due to the timing of data collection, precipitation and temperature. Nineteen species of forbs were recorded at the site.

This site burned in the 2007 Murphy Complex and was subsequently aerielly seeded with Wyoming big sagebrush. Because the site burned, comparison of the 2012 data to the 1991 and 1998 data would not be appropriate as a basis to support conclusions of overall trend. The first reading following a fire essentially becomes the new baseline for trend data analysis; therefore, information from the 2012 trend reading is discussed to show the general recovery and current baseline of the site.

Evaluation Finding – West Pasture of the Grassy Hills Allotment is:

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

Rationale for Evaluation Finding

Diversity of the perennial species within the West Pasture of the Grassy Hills Allotment is as expected for areas that have burned by wildfire multiple times and have been reseeded and/or allowed to recover naturally. Deep-rooted perennial bunchgrasses are the dominant functional/structural group within most areas of the seeded plant communities. Perennial species are appropriately productive and capable of reproduction. Shrubs were lacking from the seeded plant communities but perennial forbs were present and noted as abundant and diverse.

The litter amount indicator rating deviated from the reference condition found in the ESD. The presence of seeded species can result in higher biomass production, resulting in more litter than is described in the ESD reference sheet, especially in seedings. However, litter is providing cover for site protection and replenishment of nutrients and does not appear to be negatively affecting ecological processes, as shown by adequate soil moisture, as well as plant growth/annual production matching what is expected at each site.

Cheatgrass was not present at the site during the IIRH evaluation and adequate desirable perennial species and biological soil crusts are present within the seeded plant communities to hinder the establishment and spread of invasive or noxious plant species.

Wyoming big sagebrush was not observed at the site and yellow rabbitbrush was recorded as being present as 0.5 percent cover; however, reseeding efforts have taken place in following several wildfires, the most recent after the 2007 Murphy Complex Fire. The lack of shrub cover is apparent in the pasture but seedling were noted to be present. Shrubs function to catch snow and thereby increase infiltration and sagebrush roots can redistribute small amounts (less than 0.3 inches) of water in the soil profile up to 1.5 meters in depth (Ryel et al., 2003).

The combination of the presence of large statured, deep rooted perennial bunchgrasses, shallow rooted, perennial grasses, and perennial forb species all allows the seeded vegetation communities within the West Pasture to function to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle. With the exception of recurring fire, current management is expected to provide for maintenance of seeded and native vegetation, native animal habitat, and ecological processes (nutrient cycling, hydrologic cycling, and energy flow) within the seeded plant communities. Therefore, the West Pasture of the Grassy Hills Allotment is meeting Standard 5.

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 Camas Slough and Grassy Hills Allotments are dominated native and non-native seeded perennial grasses; therefore, Standard 6 does not apply.

Standard 7 (Water Quality)

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

X Standard Doesn't Apply

No water quality assessments have been completed within the Camas Slough and Grassy Hills Allotments and beneficial uses have not been designated by Idaho Department of Environmental Quality (IDEQ, 2014). Camas Slough occurs within the IDEQ Assessment Unit ID17040213SK00_02 and is included in Appendix C (Zero Flow Assessment Units) in the 2012 Integrated Report (IDEQ 2014). The IDEQ has not designated beneficial uses for Camas Slough and has not identified any water quality impairments because their assessment methodology is limited to perennial, wadeable and nonwadeable water bodies (IDEQ 2014). Based on water rights, beneficial uses of the water in ponds is primarily for livestock and wildlife. Water quality for the designated beneficial uses for cold water biota, warm water biota, primary contact recreation or secondary contact recreation do not apply to the stock ponds and the Camas Slough wetland. No perennial water bodies are present within the allotments. Therefore, Standard 7 does not apply to the Camas Slough and Grassy Hills Allotments.

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 allotments. In the Jarbidge Field Office special status plants are generally associated with distinct soil types that occur on scattered portions of the field office. None of these soil types occur within these allotments based on SSURGO soil data (NRCS, 2012). The Camas Slough and Grassy Hills Allotments do not contain habitat for slickspot peppergrass (*Lepidium papilliferum*; Proposed Endangered, BLM sensitive species) (BLM, 2012). The nearest known occupied habitat for slickspot peppergrass is 6 miles away, on the west side of Clover Creek.

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 in the Camas Slough and Grassy Hills Allotments are discussed below.

There are no BLM sensitive or federally listed fish or aquatic invertebrates or their habitat within these allotments. No perennial streams are present in these allotments.

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 desirable 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 young sage-grouse switch from eating forbs to sagebrush and continue eating primarily 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:

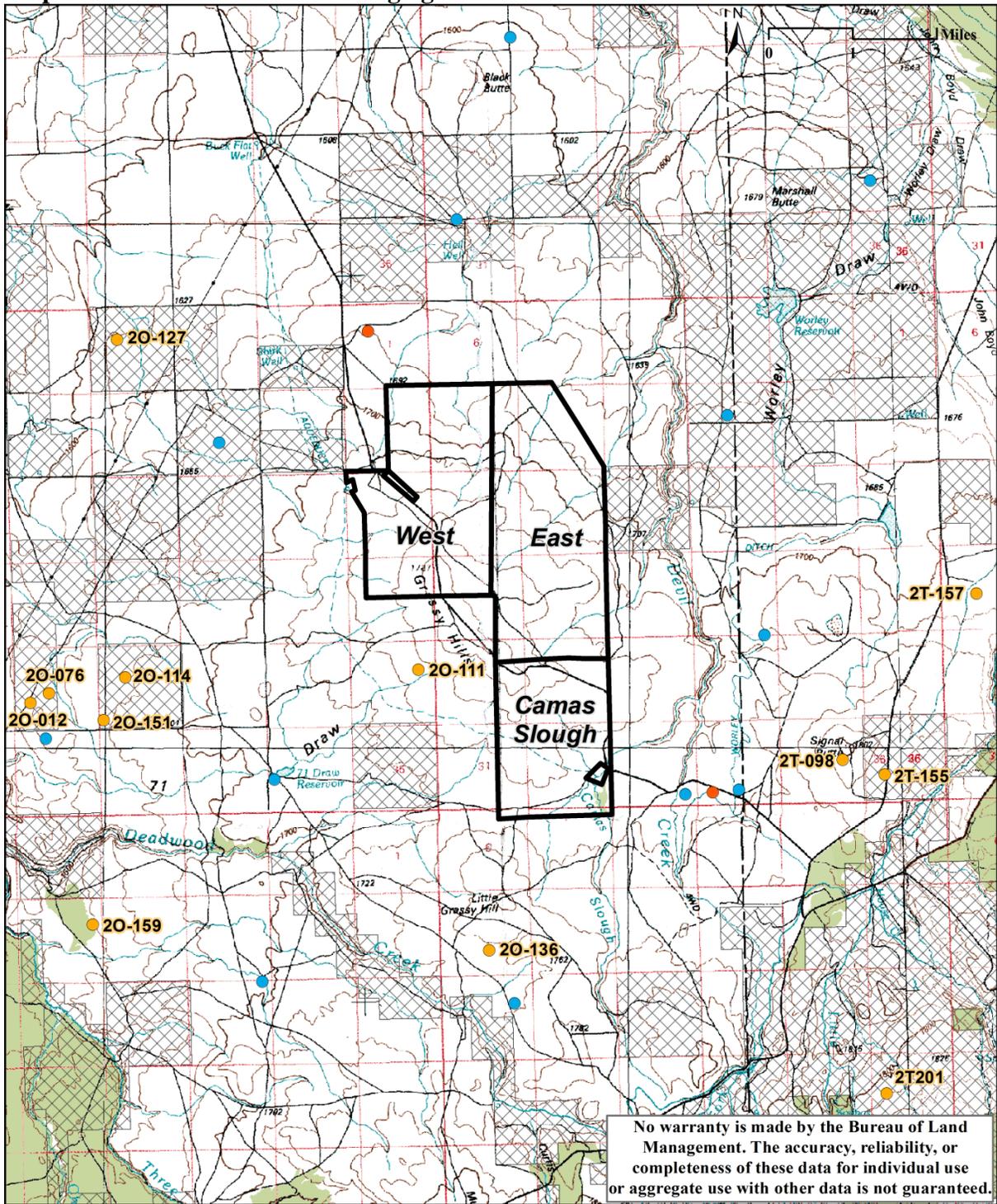
- Nesting and early brood rearing habitat should support 15-25% canopy cover of sagebrush, perennial herbaceous cover should average at least 7” in height with at least 10% canopy cover for grasses and at least 5% for forbs and a diversity of forb species during spring (Connelly et al., 2000).
- Late brood rearing habitat should support 10-25% 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% canopy cover of sagebrush with at least 10-14” exposed above the snow (Connelly et al., 2000).

The 2007 Murphy Complex Fire essentially eliminated all sagebrush in the allotments. The only area mapped as sagebrush in these allotments is 14 acres in size and is located southeast of Camas Slough. The area of sagebrush is approximately 60% low sagebrush (*Artemisia arbuscula*) and 40% Wyoming big sagebrush.

Following the 2007 Murphy Complex Fire, the BLM aerial seeded sagebrush in strips. Although 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.

The nearest large areas of sagebrush occurs 2.5 miles to the southeast in the House Creek and Little House Creek FFR Allotments (Map 8).

Map 8: Shrubland Habitat and Sage-grouse Leaks



Camas Slough and Grassy Hills Allotments & Pastures	Shrubland	Management Status
Non-BLM Land		Occupied
		Undetermined
		Unoccupied

No sage-grouse leks occur within the allotments. Within five miles there are 9 occupied, 8 undetermined (due to a lack of recent surveys), and 2 unoccupied sage-grouse leks (Map 8). Sage-grouse attendance at occupied leks within 5 miles of the allotments is shown in Table 23. Leaks are considered occupied if there has been documented sage-grouse activity within the past five years.

Table 23: Sage-grouse Attendance at Occupied Leaks within Five Miles of the Camas Slough and Grassy Hills Allotments, 2000-2014.

Lek	Location	Survey Year ¹														
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
2O-111	0.9 mile S	20	--	--	8	8	7	19	--*	0	19	19	14	11	2	2
2O-136	1.6 miles S						8	--	29*	26	12	15	15	--	--	--
2T-098	2.8 miles E	11	0	2	2	0	4	2	0*	2	8	6	13	15	19	19
2O-114	3.0 miles W										4	5	--	--	--	--
2O-127	3.2 miles NW										6	3	--	--	--	--
2T-155	3.4 miles E	6	0	1	--	--	--	--	--*	0	0	--	2	0	--	0
2O-151	3.4 miles W	--	--	--	--	--	13	--	--*	8	3	3	0	6	--	5
2O-076	3.9 miles W	--	--	--	--	--	--	--	--*	--	--	5	--	--	--	--
2O-012	4.2 miles W										8	--	12	--	--	--
2T-157	4.4 miles E	18	16	8	--	15	13	14	10*	9	7	5	5	8	--	2
2T-201	4.6 miles SE								30*	--	7	--	--	--	--	32
2O-159	5.0 miles SW										5	10	--	--	--	--

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 sites **CS-** Camas Slough Pasture and **GHW-** Grassy Hills West Pasture. An assessment was also conducted in 2013 at HAF site **GHE-** Grassy Hills East Pasture and the locations of HAF sites are shown in Map 7.

Sage-grouse droppings were observed during the assessment in the Camas Slough Pasture; however, no sign was observed in the Grassy Hills East and West Pastures. No sage-grouse sign was observed during the IIRH field visits. Sage-grouse habitat suitability assessments are not necessarily an indication of rangeland health; they are 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 24.

Table 24: 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%
Average Sagebrush Height	12 - 30"	10 - 11" or > 30"	< 10"
Sagebrush Growth Form	Spreading	Mix of spreading and columnar	Columnar
Average Grass Height	≥ 7" CS(9"), GHE(9.0"), GHW(8")	5 - < 7"	< 5"
Average Perennial Grass Canopy Cover	≥ 10% CS(34.5%), GHE(71%), GHW(70%)	5 - < 10%	< 5%
Average Forb Canopy Cover	≥ 5% CS(13%), GHW(6%)	3 - < 5%	< 3%
Preferred Forb Abundance and Diversity	Forbs common with at least a few preferred species common CS	Forbs common, but only 1 or 2 preferred species present GHW	Forbs rare to sparsely present GHE
Overall Site Evaluation			CS, GHE, GHW
Pasture Evaluation			Camas Slough, Grassy Hills East, Grassy Hills West

The Camas Slough Pasture contains one HAF site. Wildfire has eliminated the majority of sagebrush in the pasture making it unsuitable for sage-grouse. HAF site CS is located in the center portion of the pasture that is mapped as a Sandberg bluegrass vegetation community. Indicators for grass and forbs were rated suitable at the site. Fifteen species of forbs were observed and they occurred at high density (average of 11.5 individual forbs plants per 0.1 m² plot). The most common forbs were longleaf phlox (*Phlox longifolia*), lambstongue ragwort (*Senecio integerrimus*), alfalfa (*Medicago sativa*), tapertip hawksbeard (*Crepis acuminata*), lupine (*Lupinus* spp.), and mourning milkvetch (*Astragalus atratus*). Cheatgrass was recorded at 0.5% along the transects. This pasture has a high potential for restoration since all habitat indicators are suitable except for the lack of sagebrush.

One HAF site is located in the Grassy Hills East Pasture (HAF site GHE). Wildfire has nearly eliminated sagebrush in the pasture making it unsuitable for sage-grouse. HAF site GHE is located in the southern portion of the pasture that is mapped as a Sandberg bluegrass vegetation community. Attributes at the site were rated suitable for perennial grass height and canopy cover, and unsuitable for forb canopy cover and preferred forb abundance and diversity. Seven species of forbs were observed and they occurred at low density (0.54 individual forbs plants per 0.1 m² plot). The most common forbs were desert biscuitroot (*Lomatium foeniculaceum*), lupine,

and pale agoseris (*Agoseris glauca*). No cheatgrass was recorded along the transects; however, cheatgrass was observed at trace levels at the site.

The Grassy Hills West Pasture contains one HAF site. Wildfire has nearly eliminated sagebrush in the pasture making it unsuitable for sage-grouse. HAF site GHW is located in an area mapped as a Sandberg bluegrass vegetation community. Attributes at the site were rated suitable for perennial grass height, perennial grass canopy cover, and average forb canopy cover. Although average forb canopy cover was rated suitable, the site was rated marginal for preferred forb abundance and diversity. Eight species of forbs were observed with the following forbs being common: longleaf phlox, pale agoseris, lambstongue ragwort, and lupine. Cheatgrass was not encountered along transects at the site.

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

Late Brood Rearing Habitat

Several small man-made reservoirs exist within the Grassy Hills Allotment (three in the West Pasture and two in the East Pasture). The East Pasture of the Grassy Hills Allotment also contains 2 small (approximately 1 acre) and 1 larger (7 acres) upland intermittent wetlands. The Camas Slough Allotment had a pond reconstructed in the early 1990's which is approximately 25 acres in size with an additional 20 acres of wetland. Water in the pond varies annually, but the deepest part (about 3 acres) of the pond may have water until August. These water sources contain a higher abundance of preferred forbs than the surrounding uplands. However, without sagebrush cover near these areas they are generally unsuitable as late brood rearing habitat for sage-grouse. The only potential late brood rearing habitat occurs in the small area of sagebrush adjacent and southeast of Camas Slough.

Winter Habitat

The allotments are unsuitable for wintering sage-grouse since the majority of sagebrush has been nearly eliminated by wildfires. The only remaining sagebrush occurs in a small isolated patch southeast of Camas Slough (14 acres). Cover of grasses and forbs for wintering habitats generally is irrelevant, because of the complete reliance of sage-grouse upon sagebrush during this period (Homer et al., 1993).

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

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

Ferruginous hawks prey primarily on smaller mammals. Prey species include ground squirrel (*Urocyon* 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 is 1 ferruginous hawk nests in an isolated juniper in the Camas Slough Pasture (Nest F03; Table 25). The nest is located 0.2 mile south of Camas Slough. This is the only tree in these allotments.

Table 25: Ferruginous Hawk Nest Data

Nest	Survey Year ¹																		
	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
F03	2	--	--	--	--	2	1	2	--	--	--	I	I	I	I	2	A	--	A

¹Surveys were not conducted in years indicated by dashes (--). If the nest was active with young, the number of young was recorded, if the nest was inactive (I) or active (A) with no young that was also recorded.

The allotments are predominately a perennial grassland that provides marginal habitat for mammalian prey (black-tailed jackrabbit, mountain cottontail, ground squirrels, etc.) favored 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).

Wildfires have eliminated the majority of sagebrush in the allotments making it unsuitable for Brewer’s Sparrow nesting. The only remaining nesting habitat occurs in a small isolated patch of sagebrush southeast of Camas Slough (14 acres). Rabbitbrush found in patches throughout both allotments may provide some limited 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.

Wildfires have eliminated the majority of sagebrush in the allotments making it unsuitable for Loggerhead shrike nesting.

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

Wildfires have eliminated the majority of sagebrush in the allotments making it unsuitable for sagebrush sparrow nesting. The only remaining nesting habitat occurs in a small isolated patch of sagebrush southeast of Camas Slough.

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 Landré, 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% of its winter diet (Green and Flinders, 1980). Grasses and forbs make up more of the diet in the late spring into early summer.

No surveys for pygmy rabbits have been conducted in the allotment. Without sagebrush the allotment is unsuitable for pygmy rabbits.

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 allotments, the BLM does not have distribution data on ground squirrels within the allotments. Wildfires have converted shrub-steppe habitats in the allotments to perennial grass communities. Because shrub habitats provide more favorable environments for ground squirrels than grass habitats (Yensen et al., 1992; Van Horne et al., 1997) the allotments were rated marginal for Piute ground squirrels.

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

Spotted bats are typically found in arid portions of the western United States where it forages primarily on moths (Adams, 2003). It roosts in rock crevices in tall cliffs (Watkins, 1977). Little is known about the behavior and population size of spotted bats.

No cliffs are present in the allotments making them unsuitable for spotted bat roosting. Potential roosting habitat lies along the cliffs associated with Devil Creek which is 0.7 mile to the east and Clover Creek which is 5 miles to the west (both outside the allotments). Spotted bats may forage over the allotments, particularly near water sources. Water is found at Camas Slough (25 acres) and in several small man-made reservoirs within the Grassy Hills Allotment (three in the West Pasture and two in the East Pasture). Water is also found in a 3 acre reservoir that borders the western edge of the West Pasture of the Grassy Hills Allotment (outside the allotment).

Additional information

The Camas Slough Allotment had a pond rebuilt in the early 1990's which is approximately 25 acres in size with an additional 20 acres of wetland when full. Water in the pond varies annually, but the deepest part (about 3 acres) of the pond may have water until August. During wetter springs the water can back up more than 1,000 feet beyond the enclosure fence. The 22 acre enclosure fence around the pond is undersized to protect the entire wetland. During the spring, the enclosure fence poses a collision hazard for shorebirds and waterfowl because the fence crosses open water. Additionally, a livestock trough and pond approximately 100 feet from the enclosure contributes to livestock damage to the wetland and enclosure fence.

The Camas Slough wetland provides habitat for waterfowl and shorebirds during the spring migration and also nesting habitat for these species. During the spring migration, white-faced

ibis (*Plegadis chihi*; BLM sensitive species) are occasionally observed at Camas Slough. However, no nesting by this species has been observed in the Camas Slough Allotment.

Evaluation for Standard 8

There are no known BLM Sensitive or Federally listed plants within the Camas Slough and Grassy Hills Allotments. These allotments do not contain habitat for slickspot peppergrass. The nearest known occupied habitat for slickspot peppergrass is 6 miles to the 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 allotments. No perennial streams occur within these allotments.

Habitat for BLM Sensitive wildlife species occurs within the allotments. 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	Camas Slough	Grassy Hills East	Grassy Hills West
Sage-grouse (nesting & early brood rearing)	U	U	U
(late brood rearing)	U	U	U
(winter)	U	U	U
Ferruginous hawk (nesting)	S	U	U
(foraging)	M	M	M
Brewer’s sparrow (nesting)	U	U	U
Sagebrush sparrow (nesting)	U	U	U
Loggerhead shrike (nesting)	U	U	U
Pygmy rabbit (year round)	U	U	U
Piute ground squirrel (year round)	M	M	M
Spotted bat (roosting)	U	U	U
(foraging)	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 unsuitable since wildfire has eliminated the majority of sagebrush in the allotments. The only remaining patch sagebrush occurs in a small isolated patch (14 acres) southeast of Camas Slough. Grass height was rated suitable in all pastures. Forb abundance and diversity was suitable in the Camas Slough Allotment, marginal in the Grassy Hills West Pasture and unsuitable in the Grassy Hills East Pasture. Cheatgrass was either not encountered along the transects or was only observed at trace levels. Reservoirs, ponds, and intermittent wetlands occur in these allotments. These water sources may contain a higher abundance of preferred forbs than the surrounding uplands. However, without sagebrush near these areas, the allotments are generally unsuitable as late brood rearing habitat. Without sagebrush of adequate size and density in these allotments, wintering habitat was rated unsuitable.

Only one tree occurs in Camas Slough Allotment. This juniper contains a ferruginous hawk nest. No trees or cliffs are present in the Grassy Hills Allotment. The allotments are predominately perennial grasslands which provide marginal habitat for prey species usually hunted by ferruginous hawk.

Without sagebrush, the allotments were rated unsuitable for Brewer's sparrow, loggerhead shrike, and sagebrush sparrow nesting. Pygmy rabbit habitat was also rated unsuitable.

Wildfires have converted shrub-steppe habitats in the allotments to perennial grass communities. Because shrub habitats provide more favorable environments for ground squirrels than grass habitats (Yensen et al., 1992; Van Horne et al., 1997), the allotments were rated marginal for Piute ground squirrels.

Spotted bat roosting habitat is not found in the allotments. Spotted bats may forage over the allotments and drink at Camas Slough and at various reservoirs found through the allotments.

Evaluation Finding – Camas Slough and Grassy Hills Allotments are:

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

Rationale for Evaluation Finding

The 2007 Murphy Complex Fire eliminated the majority of sagebrush in the Camas Slough Allotment and the East and West Pastures of the Grassy Hills Allotment, making them unsuitable for sage-grouse and other sagebrush dependent species. The only area mapped as sagebrush in the allotments is located in a small isolated patch (14 acres) southeast of Camas Slough.

Following the 2007 Murphy Complex Fire, the BLM aerial seeded sagebrush in strips. Although 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. Therefore, the Camas Slough and Grassy Hills Allotments are not meeting Standard 8.

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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: PLANT SPECIES LIST ACCUMULATED DURING UPLAND ASSESSMENTS

Scientific Name	Common Name	Species Type	Site(s) where species occurred
Perennial Grasses			
<i>Achnatherum hymenoides</i>	Indian ricegrass	Native	CS
<i>Achnatherum thurberianum</i>	Thurber's needlegrass	Native	CS
<i>Agropyron cristatum</i>	Crested wheatgrass	Exotic, Seeded	CS, GHW
<i>Elymus elymoides</i>	Squirreltail	Native	CS
<i>Festuca idahoensis</i>	Idaho fescue	Native	CS, GHE
<i>Leymus cinereus</i>	Basin wildrye	Native	GHE
<i>Pascopyrum smithii</i>	Western wheatgrass	Native	CS, GHW
<i>Poa secunda</i>	Sandberg bluegrass	Native	CS, GHE, GHW
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass	Native, Seeded	CS, GHE, GHW
Annual Grasses			
<i>Bromus tectorum</i>	Cheatgrass	Exotic, Invasive	CS, GHE
Perennial Forbs			
<i>Achillea millefolium</i>	Western yarrow	Native, Sage-grouse Preferred	CS
<i>Allium</i> spp.	Onion	Native	GHE
<i>Astragalus atratus</i>	Mourning milkvetch	Native	CS
<i>Astragalus lentiginosus</i>	Freckled milkvetch	Native	CS, GHW
<i>Cirsium</i> sp.	Thistle	Native	CS
<i>Crepis acuminata</i>	Tapertip hawksbeard	Native, Sage-grouse Preferred	CS
<i>Crepis occidentalis</i>	Largeflower hawksbeard	Native, Sage-grouse Preferred	GHW
<i>Erigeron pumilus</i>	Shaggy fleabane	Native, Sage-grouse Preferred	CS
<i>Ionactis alpina</i>	Lava aster	Native, Sage-grouse Preferred	CS
<i>Lomatium</i> spp.	Desertparsley	Native, Sage-grouse Preferred	GHW
<i>Lomatium foeniculaceum</i>	Desert biscuitroot	Native, Sage-grouse Preferred	GHE, GHW
<i>Lupinus</i> spp.	Lupine	Native	CS, GHE, GHW
<i>Mertensia oblongifolia</i>	Oblongleaf bluebells	Native	CS
<i>Medicago sativa</i>	Alfalfa	Exotic, Sage-grouse preferred	CS
<i>Phlox longifolia</i>	Longleaf phlox	Native, Sage-grouse Preferred	CS, GHE, GHW
<i>Senecio integerrimus</i>	Lambstongue ragwort	Native	CS, GHW
<i>Tragopogon dubius</i>	Yellow salsify	Exotic, Sage-grouse Preferred	CS, GHE
<i>Zigadenus venenosus</i>	Meadow deathcamas	Native	GHE
Annual Forbs			
<i>Agoseris glauca</i>	Pale agoseris	Native, Sage-grouse Preferred	CS, GHE, GHW
<i>Cerastium nutans</i>	Nodding chickweed	Native	CS, GHW
<i>Collinsia parviflora</i>	Maiden blue eyed Mary	Native	GHW
<i>Epilobium brachycarpum</i>	Tall annual willowherb	Native, Sage-grouse Preferred	CS
<i>Lepidium perfoliatum</i>	Clasping pepperweed	Exotic	CS
<i>Microsteris gracilis</i>	Slender phlox	Native, Sage-grouse Preferred	CS, GHW

Scientific Name	Common Name	Species Type	Site(s) where species occurred
<i>Sisymbrium altissimum</i>	Tall tumbled mustard	Exotic	CS
Shrubs			
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	Native	CS, GHE

This list does not include all plants that can be found in the Camas Slough and Grassy Hills Allotments and is not exhaustive. Scientific and common names were derived from the USDA NRSC Plant Database (USDA and NRCS, 2013c).

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